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TARR AND McMURRY GEOGRAPHIES

FOURTH PART
GENERAL GEOGRAPHY
SOUTH AMERICA AND EUROPE

BY

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WITH NUMEROUS MAPS AND MANY ILLUSTRATIONS, CHIEFLY
PHOTOGRAPHS OF ACTUAL SCENES

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PREFACE

REVIEW OF GENERAL GEOGRAPHY.—Following our plan of providing frequent reviews of salient points, we have in this book prefaced sections devoted to the continents with a few chapters on general geography. Especially important subjects, such as winds, ocean currents, climate, etc., which served as topics in the preceding book, are again taken up. But the matter is not merely repeated, for these discussions assume some knowledge of the subject treated and carry the inquiry further than before. By this plan a review is provided, and, at the same time, a more advanced and wider knowledge is obtained.

REVIEW OF NORTH AMERICA.—A common defect in the teaching of geography is that the facts previously learned about the United States fade from the pupil's memory while other countries are being studied. Yet the relation between North America and the other continents is so marked that this defect is unnecessary. For example, most of the industries and important principles of physiography and climate have received the attention of a child when he has completed a general study of the United States. Foreign lands illustrate the same great ideas under slightly different conditions. This means that the comprehension of foreign countries may best be gained by our children if they use their previous knowledge of the United States as a basis of comparison. If, then, this old related knowledge is carefully called to mind when the physiography, climate, and industries of a foreign land are approached, our pupils will not only secure a fuller appreciation of that region, but will also keep alive their present knowledge of the United States by bringing it into use.

The above has been a controlling idea in writing this volume. Accordingly in approaching the physiography of South America (p. 96), the physiography and climate of Europe (pp. 150-163), grazing in Argentina (p. 119), mining in Great Britain (p. 183), etc., we have reproduced the corresponding situation in our own country at some length. Besides this, we have included in the text scores of brief comparisons with the United States. By this means incidental reviews are continually provided, which are especially attractive to both teachers and pupils because they contain more of motive than the ordinary "review for review's sake."

To supplement this kind of review several sets of questions, which call for still different comparisons with the United States, are included in the book, one series being found at the close of the treatment of each continent. These are likewise rich in motive, inasmuch as they recall leading facts in regard to the United States from varying points of view. It should be kept in mind also that each set at the same time reviews another continent from a new point of view.

Many of the facts in regard to the United States which these questions call for are not presented in the text treating of the various continents, and answers for a few of them are not indicated in the maps. Also pupils may have forgotten other important information about the United States. For these reasons Section XXIV, covering thirty-six pages, is an organized review of North America alone. It includes the principal facts about our continent which every pupil should know on completing the grades. In several important respects it is different from that presented at the close of our Second Book, and possesses, therefore, an element of freshness.

The title of the last section, "The United States in Comparison with Other Countries," indicates provision for still further review. It has seemed to the authors an anti-climax to close several years' study of geography with the *Islands of*

the Pacific, lands farthest away and of least interest to us. On the other hand, it has been deemed highly important that, after all the countries of the world have been treated, the closing chapter should summarize the situation and show the rank of our own land and its relation to others. This secures a final reconsideration of the principal facts in our geography, while at the same time it brings them into proper relation and perspective.

On the whole, we are of the opinion that reviews should occupy a large part of the time of instruction; and by the plan followed we hope that pupils will have a fairly complete knowledge of the United States and the rest of the world in their possession, not only when they finish the grades, but in years to follow.

FULNESS OF TREATMENT. — The plan of this series of geographies provides for a fulness of treatment of foreign countries corresponding to that of the United States in the Second Book. Europe naturally receives most attention, the British Isles occupying thirty-five pages and Germany twenty-four. Our plan may be understood by reference to the British Isles. In that section we state the leading points of history, physiography, and climate, and point out their relation to the marvellous natural development. The relation of the industries and cities to one another is brought out, as well as reasons for the supremacy of the British on the sea, their many colonies, and their vast foreign trade. Such extensive treatment frees the earnest teacher from the necessity of overtaxing strength in ransacking libraries in search of sufficient material to produce reasonably vivid, correct, and stimulating pictures in the minds of pupils.

SUGGESTIONS AND REFERENCES. — At the same time this volume *invites* both teacher and pupil to go beyond the text. The book is intended for the last two years of the grammar school, and probably some children will find the text alone as

much as they can master. But for others some of the suggestions and references will no doubt prove interesting and lead to research. Thus the course of study is made flexible by offering more than the average amount of work for those who are capable of doing more. Also, by means of the references, specific sources are indicated to which the instructor may go for further knowledge.

PHYSIOGRAPHIC BASIS AND CAUSAL SEQUENCE. — The same close sequence sought after in the preceding work has been attempted here. Physiography is considered the basis for the causal series of facts, and we have therefore introduced the subject freely; but not too freely, provided each physical fact is shown really to function in man's relation to the earth. We have endeavored to provide that the effects of carefully selected facts about glacial action, altitude, winds, ocean currents, etc., may be traced to individual countries in such a manner that pupils will plainly see the connection. Physiography that is clearly shown to have a *real* bearing upon man greatly enriches the subject of geography; it is the *unused* physical geography in the grades that is a stumbling block, and this we have tried to avoid.

TYPES. — The study of the United States has, as suggested above, furnished occasion for detailed treatment of most kinds of geographic topics. Some important features and occupations, however, are not found in the United States, and to these we have endeavored to give the same careful consideration as was given to other representative topics in the Second Book. For instance, so far as space permits, the Brazilian forest is presented as a type of tropical forests on page 113. Other illustrations may be found in the treatment of the rubber industry on page 115; the linen industry on page 191; and the silk industry on page 229. The object is to continue to acquaint the learner properly with the basal units of geography

POLITICAL AND RELIEF MAPS.—We again point to our political maps, as clear, artistic, and unburdened with unnecessary details. There is not a city which an American child needs to remember that is not to be found on these maps; why then make them larger and less distinct by adding other names?

The main features of the relief of the country are presented in the political maps so that they may be before the eye when these maps are studied. But for the study of the relief itself we have had prepared a set of continent models. Half tones of these appear in their proper places in the book and give pictures of the relief of the continents, which are accurate in general features and in detail.

OTHER ILLUSTRATIONS.—Many black maps are used, some to show the location of cities and the distribution of products, and some to illustrate the climatic sections. A series of maps gives a graphic view of the density of population of the continents; and each continent has its railways represented either by special maps (Figs. 119, 394, and 395) or, where the roads are few in number, by lines inserted on the political maps. The colonies of some of the leading nations are also shown on black maps (Figs. 142 and 193) and the great commercial routes of the world are represented on a single map (Fig. 433). It is believed that this large number of maps, each devoted to a specific object, will be found of great value.

Besides the maps and diagrams there are many half tones of photographs selected to supplement the text. They are not introduced merely as pictures, but as a part of the fund of information offered. For this purpose the half tone is the best adapted. There is reason for confidence in the accuracy of such views.

ACKNOWLEDGMENTS.—The political and many of the black maps were made by the Matthews-Northrup Co. of Buffalo; the relief maps by E. E. Howell of Washington. The world

maps showing the distribution of products (Section XXV) are in part based upon maps kindly furnished to us by the Philadelphia Commercial Museum, and a few of them are actual reproductions of the Museum maps. Our photographs have been selected from various sources; but in this volume, as in those which precede it, the larger number have been purchased from William H. Rau of Philadelphia. Through the kindness of Commander Webster we have obtained permission to use the photographs reproduced in Figures 244, 285, 286, 287, and 290; and Figures 42, 48, 54, 55, 56, 62, 65, 67, 69, 72, 87, 88, 252, 268, 337, 342, 346, and 348 are borrowed from Ratzel's "History of Mankind." A number of European views were loaned by Dr. Heinrich Ries of Cornell University; and the wash drawings were made by Mr. C. W. Furlong, also of Cornell.

Again we are deeply indebted to Mr. Philip Emerson of the Cobbet School, Lynn, Massachusetts, for his suggestive criticism of the manuscript and for further aid in the preparation of the section on Australia. Valuable assistance in the preparation of statistical tables, books of reference, etc., has again been rendered by Mr. R. H. Whitbeck of Cornell University. While we have drawn upon many sources for the information upon which the text in this volume is based, the extensive use that has been made of Mill's "International Geography" and the "Statesman's Yearbook" — books that every geography teacher should have at hand — calls for special acknowledgment.

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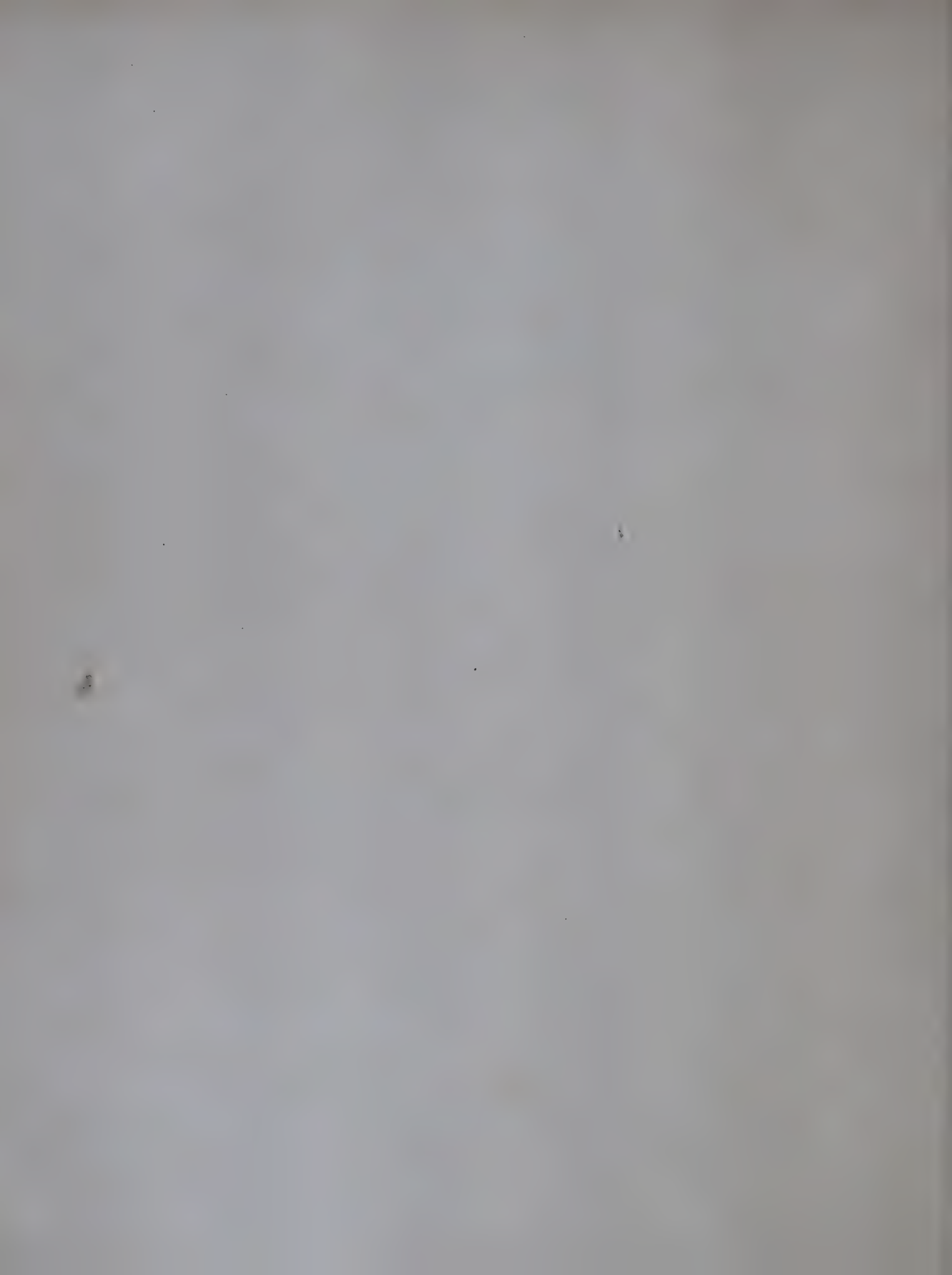
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PART I

GENERAL GEOGRAPHY



I. THE EARTH AS A PLANET

Stars and Planets. — As we look into the heavens at night, thousands of stars meet our gaze, and by the help of powerful telescopes many more thousands have been discovered. The stars are fiery hot bodies like the sun, but so far away that they appear only as twinkling lights.

Some impression of the immensity of the universe is gained when we reflect that some of the stars are so distant that their light, which is now reaching our eyes, may have started toward us as long ago as the time of Christ. Yet light travels so rapidly that it takes less than nine minutes for it to pass over the 93,000,000 miles that separate us from the sun.

Some of the brightest of the heavenly bodies have no light of their own, but, like the moon, merely reflect light that falls upon them from the sun. They do not remain in one part of the heavens, as the true stars do, but slowly change their position. For this reason they were long ago called *planets*, which means wanderers.

The planets are much nearer to us than the myriads of stars; in fact, they are members of the solar family to

which the earth belongs. The sun is the centre of this family, or *solar system*, and supplies the members of it with light and heat. The eight large planets, named in the order of their distance from the sun, are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

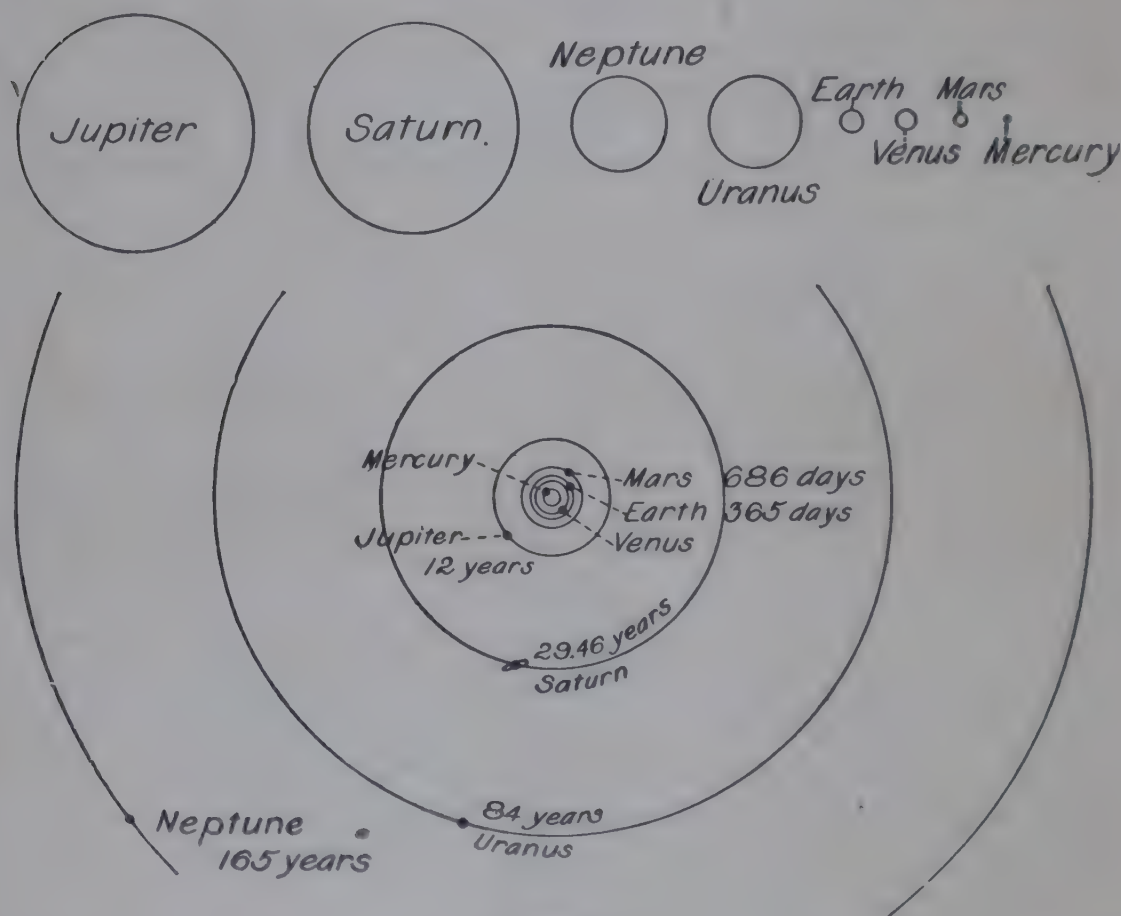


FIG. 1.

The circles at the top show the relative size of the planets; the lower figure shows their relative distances from the sun.

The two most distant of the planets cannot be seen without a telescope; but the others are easily seen, and Venus is the most brilliant object in the heavens, next to the sun and moon. It appears either as the Evening Star or the Morning Star. Find some of the planets in the sky.

There is a very close resemblance among the members of

this solar family. All are spherical in form, and each one, whose movements are known, rotates upon an axis while revolving about the sun; but the periods required to complete their revolutions vary greatly with different planets. For example, Mercury, about 36,000,000 miles from the sun, takes less than three months for one journey around it; while Neptune, about 2,700,000,000 miles distant, requires 165 years for a single revolution. How far is the earth from the sun, and how long does it take for one revolution?

Ocean Basins and Continents. — It is believed that all of the planets were once hot bodies like the sun and the

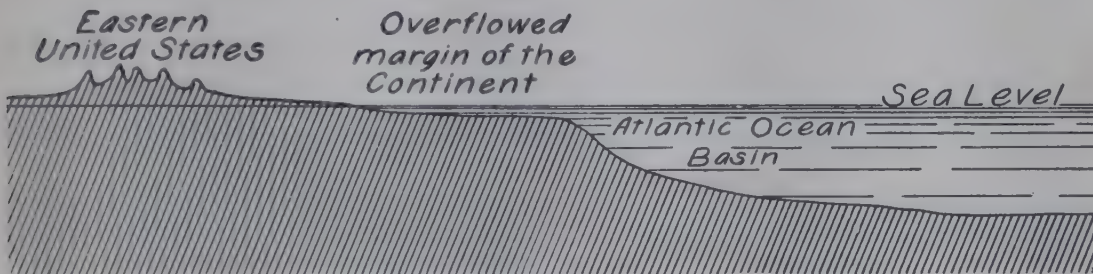


FIG. 2.

To illustrate the fact that the oceans fill the great depressions in the earth's crust that lie between the continent upfolds.

stars. The larger planets have not cooled as much as the earth, and some of them seem still to be hot. For example, the atmosphere of Jupiter is always full of clouds, as if the heat of the planet caused the ocean water to rise as steam. On the other hand, Mercury, Mars, Venus, and the Earth (Fig. 1), being so much smaller, have of course cooled more quickly. They have therefore become solid, and a cold "crust" of minerals and rocks has formed around the still heated interior.

You will recall that the interior of the earth continues to cool and contract, the crust settles upon it and is thus thrown into folds and wrinkles. It is these great

upfolds that form the continents, while the downfolds form the ocean basins.

Water fills the extensive, depressed portions of the earth's surface, and even overflows the lower margin of the elevated areas (Fig. 2). Thus only about one-fourth of the earth's surface rises above the water. In which hemisphere is most of the land? (Fig. 3.) In which is most of the water? Locate the five oceans on a globe.¹



FIG. 3.

The land and water hemispheres.

While a broad ocean encircles the south polar region, land surrounds the north pole, extending southward in two great masses that are almost united at Bering Strait. The smaller of these, in the western hemisphere, includes North and South America, the New World; while the much larger Old World includes the great continents of Eurasia and Africa. South of Asia, in the southern hemisphere, is Australia, also classed as a continent. Find each of these on a globe.

Compare the continents with each other and with the United States in size (see Tables just before Index). Three are tri-

¹ See also the two maps inserted just before the list of Books of Reference.

angular in shape with the apex of the triangle pointing southward, while Eurasia has its greatest extent from east to west. Compare them as to their regularity of outline. Tell what bodies of water separate each continent from the others.

Mountains and Volcanoes. — As the heated interior of the earth has contracted, it has not only thrown the surface into a few broad folds, forming continents and ocean basins, but here and there the crust has been crumpled into narrower folds, forming mountain ranges. During the growth of mountains the rocks are both



FIG. 4.

Mount St. Helens, Washington, a volcanic cone north of Portland, Oregon (copyrighted, 1899, by H. A. Hale).

folded and broken. Through the cracks thus formed melted rock sometimes rises in such quantities as to build lofty peaks or cones known as *volcanoes* (Fig. 4). From Cape Horn to Alaska there is an almost unbroken series of mountain systems, among whose peaks are many volcanoes, some of which are still in action.

Name the western ranges of North and South America, and such volcanoes of North America as you remember. Some of these mountain ranges are still rising, especially in South America, where within the last century the land in some places has been uplifted several feet. This rising of the land has

been accompanied by destructive earthquake shocks caused by the slipping of the rocks as they moved one upon another.

A great girdle of mountains and volcanoes borders the Pacific (Fig. 5), reaching from Cape Horn to Alaska, and thence to the Kurile Islands by the way of the Aleutian chain. It then continues southward along the Japanese Islands to the Philippines and the East Indies, all of which are



FIG. 5.

The girdle of mountains and volcanoes encircling the Pacific Ocean. Extinct volcanoes shown by circles, others by black dots.

mountainous islands where elevation is still in progress and where active volcanoes abound.

There are other mountain ranges and associated plateaus on each of the continents to be studied about later. Just now it is important to speak of but one other series of mountain folds, and these extend nearly east and west, while the mountains of the girdle just mentioned reach for the most part in a north and south direction. The east

and west series includes the mountain systems of Eurasia, among which are the lofty ranges of central and southern Asia. These ranges reach their greatest elevation in the Himalayas on the southern border of the plateau of Tibet. Here are the loftiest mountains of the world. Other mountain chains of this series are situated much farther west, among the highest being the Caucasus, Alps, and Pyrenees in Europe.

REVIEW QUESTIONS. — (1) What is a star? — (2) Give some idea of the distance of the stars from us. (3) What is a planet? (4) Name the eight planets. (5) Mention some points of similarity among them. (6) Of difference. (7) How has the earth's crust been formed, with its continents and ocean basins? (8) What is the extent and position of the water surface? (9) Describe each of the five oceans. (10) Similarly describe the land surface. (11) Tell about the girdle of mountains and volcanoes which encircles the Pacific. (12) Name and locate some of the mountain systems which extend east and west.

SUGGESTIONS. — (1) Find the north star. (2) Find some of the constellations. (The Great Dipper and Cassiopeia are always in sight at the north, and the Pleiades and Orion may be seen in the east on autumn evenings.) (3) Write out the observations you have made about the moon. (4) Make a careful sketch of Venus or Jupiter and the stars near them. After some days or weeks make a similar drawing and compare the two. (5) What might be some of the effects if the earth's revolution about the sun required a much longer period? (6) What changes might result if there were less water in the ocean depressions? (Think of effects on size of continents; on commerce; on climate; and on land adapted to agriculture.) (7) State some of the changes that would result if there were enough water to raise the level of the sea a thousand feet. (8) Draw a map of the Pacific Ocean, and with colored pencil, or ink, draw lines to show the surrounding mountain ranges of the continents and the island chains (Fig. 5).

BOOKS OF REFERENCE FOR EACH SECTION ARE LISTED AT THE END OF THE BOOK.

II. MOVEMENTS OF THE EARTH AND THEIR RESULTS

Daily Motion. — Like the other planets the earth is rapidly rotating, that is, turning on one of its diameters, called the *axis*. When we glance out of the window of a moving car, the objects we pass appear to be moving in the direction opposite to that in which we are travelling. It seems as though we were standing still. In a similar way the rotation of the earth makes the sun *appear* to rise and set, and for a long time people believed that it was the sun that moved, and not the earth.

In what direction must the earth rotate, since the sun appears to move from east to west? The period of time required for one rotation is called a *day*. Since the circumference of the earth at the equator is about twenty-five thousand miles, how far does a point on the equator move in an hour? In a minute?

By rotating a globe or an apple in the sunlight show how day and night are caused on the earth. Hold the sphere still; what would be true on opposite sides of the earth if it did not rotate at all? What might be the effect upon life on the earth if the same side were always toward the sun?

Yearly Motion. — While the earth makes one complete rotation in a day, it requires a whole *year* to make one journey, or *revolution*, around the sun. As the earth travels along its path, the stars on one side of the sun are visible on July evenings, and quite different stars and constellations on January evenings.

But this change in the appearance of stars is much less noticeable than the changes in the seasons, which are also due in part to the earth's revolution around the sun. If one part of our planet, as for instance the north pole, or the equator, or the south pole, were always turned toward the sun, revolution would not cause changes of season. As a

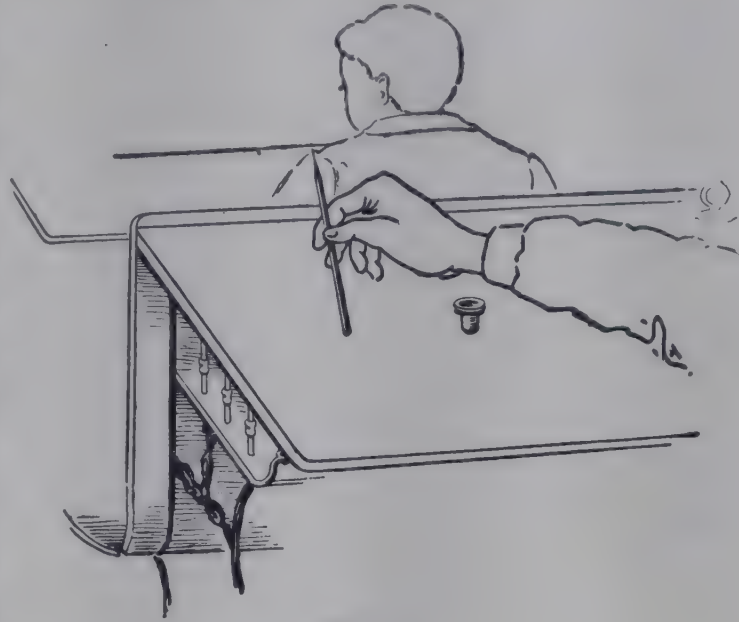


FIG. 6.

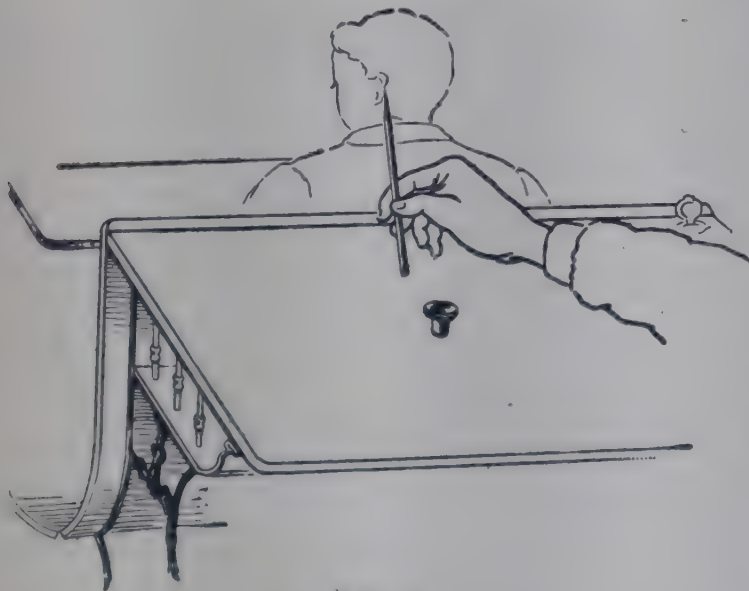


FIG. 7.

turned toward the sun is continually changing.

Place an ink bottle upon your desk. Then rest the blunt end of your pencil upon the table a few inches to the left of the bottle, with the pointed end inclined from you

(Fig. 6). Notice that neither end of the pencil is now inclined toward or away from the bottle.

Now, keeping the pointed end inclined from you, always in the same direction, slowly move the pencil away from you in a circle around the bottle. When the side farthest from you is reached, the blunt end of the pencil is toward the bottle, while the point is turned away (Fig. 7). On reaching the right side, the two ends are again so

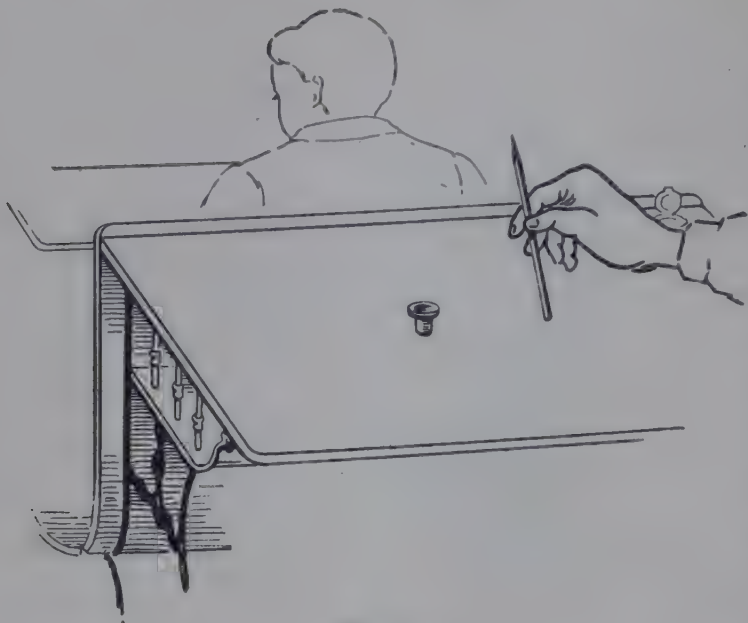


FIG. 8.

placed that neither is turned from the bottle (Fig. 8); but on arriving at the side nearest to you, the pencil point is inclined toward the bottle, while the blunt end is turned away (Fig. 9).

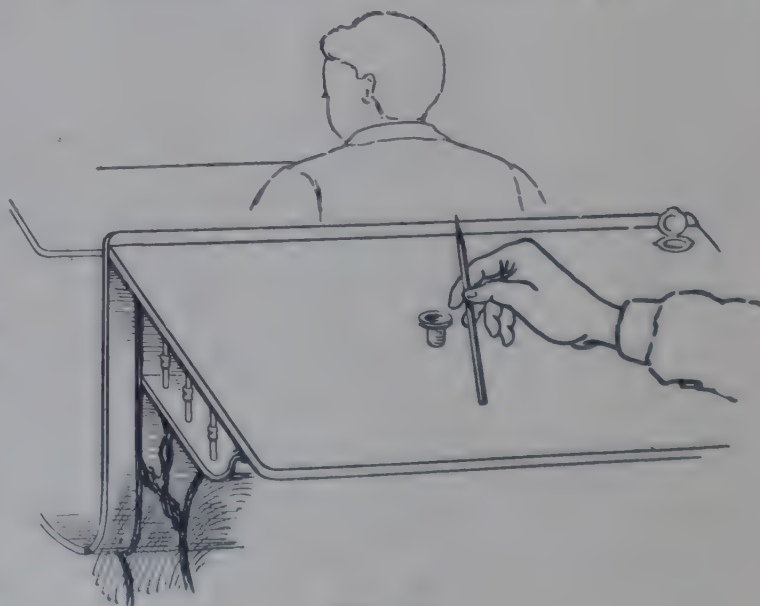


FIG. 9.

These positions of the pencil well illustrate those of the earth's axis with relation to the sun. The bottle represents the sun; the circular path followed by the

pencil represents the *earth's orbit* or the slightly elliptical path taken by the earth in its journey about the sun; and the pencil stands for the earth's axis. The pencil, instead of being perpendicular to the surface of the desk, was somewhat inclined; and the earth's axis is also inclined to the plane through which the earth revolves, or *the plane of the orbit* (Fig. 10). The axis of the earth remains in this one position, pointing toward the north star.

Results of the Earth's Revolution and Inclination of its Axis. — This fact of the unchanging inclination of its

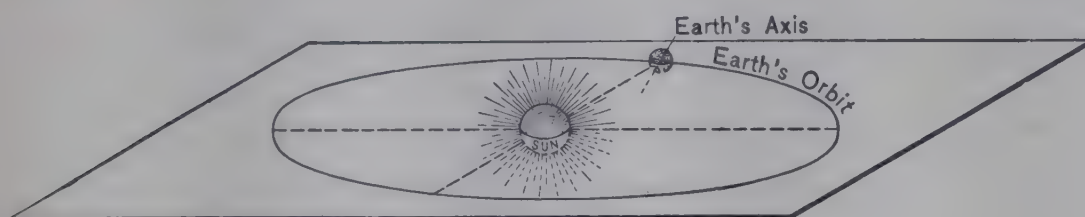


FIG. 10.

To illustrate the inclination of the earth's axis to the plane of its orbit.

axis, as the earth revolves about the sun, may seem a small thing in itself; but it is really of such momentous importance that hundreds of our customs are regulated by it. It determines the time when lamps shall be lighted, when grain shall be planted and harvested, and when the navigation of rivers and lakes shall open and close in cold climates. It also greatly influences the kind of clothing that we wear and the sports that we enjoy. Name some other of its influences. It does all this by continually changing the length of our day and the inclination at which the sun's rays reach the earth's surface.

Figure 11, showing the position of the earth on September 23, corresponds to the first position of the pencil (Fig. 6). Although the axis is inclined, neither pole is

turned from the sun, and the light therefore extends from pole to pole. Then the sun's rays are vertical at the

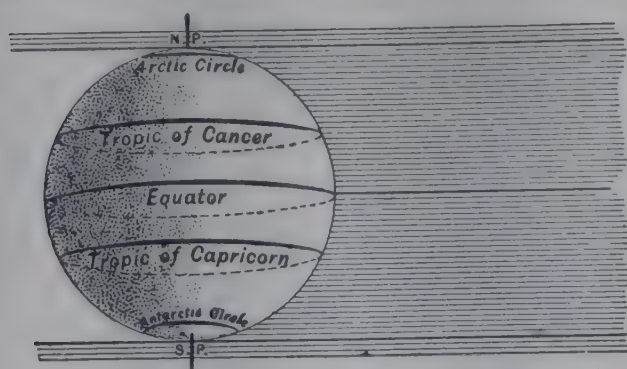


FIG. 11.

Position of the earth September 23. Notice that the vertical rays (heavy line in middle) are at the equator. Compare with Figure 6.

of the pencil, or that of December 21, when the earth's revolution has brought the south polar region toward the sun and into the light, while the north polar region is shrouded in darkness. The vertical

rays have now passed south to the *Tropic of Capricorn*. Examine a globe to see what countries are crossed by this line.

Here the sun seems to turn and move northward, and for

that reason this parallel is called a *tropic* (from a word meaning *to turn*).

When the sun is vertical over the Tropic of Capricorn, it is summer for lands south of this tropic, and the people of these lands have their longest day. Indeed, the south pole itself has

Rays from Sun

equator, and the days and nights are equal over all the earth. This time is called the *autumnal equinox* (the latter from two words meaning *equal* and *night*).

Figure 12 represents the earth in the second position

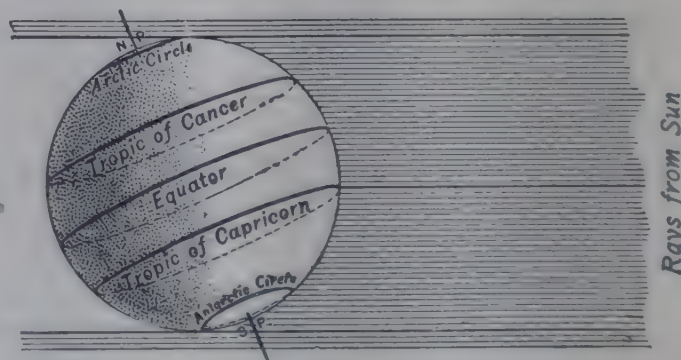


FIG. 12.

Position of the earth December 21. Where are the vertical rays now? What about the north pole? Compare with Figure 7.

Rays from Sun

been constantly in the sunlight for three months, and on December 21 the entire region within the Antarctic Circle has sunlight for the full twenty-four hours. On the other hand, we whose homes are in the northern hemisphere have our shortest day at this date, and winter is upon us. The north pole has been entirely without sunlight for three months, and the whole area within the Arctic Circle is in darkness even at midday. What is the condition of Europe then?

Figure 13 shows the third position, or that of March 21, when the poles are again turned neither toward nor away from the sun. The equator is once more under the vertical rays of the sun, and the days and nights are equal the world over. This period, called the *vernal equinox*, is the commencement of our spring. After

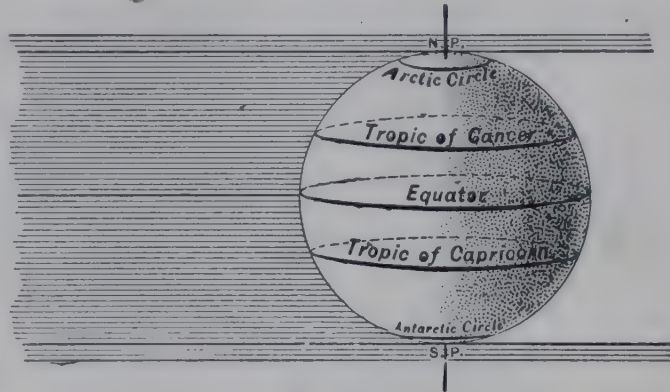


FIG. 13.

Position of the earth March 21. Where are the rays vertical? Compare with Figure 8.

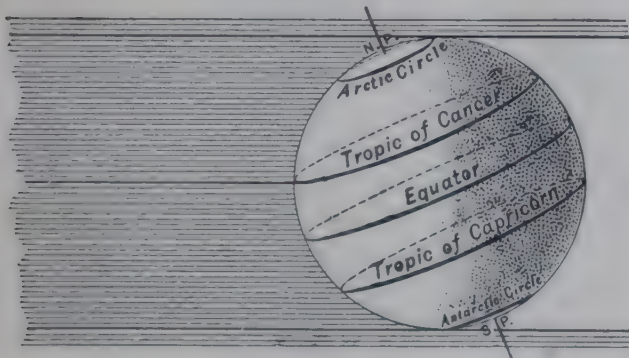


FIG. 14.

Position of the earth June 21. Compare with Figure 9.

this date our days gradually lengthen until, on June 21, the continued revolution of the earth has brought it into the fourth position (Fig. 9). The sun's rays are then vertical over the *Tropic of Cancer* (Fig. 14), and at this date we

have our longest day, and summer is upon us.

What countries of the northern continents are then warmed by the vertical rays of the sun? (See a globe or map.) The



FIG. 15.

To illustrate the revolution of the earth around the sun. The shaded portion represents night. The end of the axis around which the earth rotates is the point where the lines come together (the north pole). At what date is this pole turned toward the sun? Away from it? Neither toward nor away from it? What portions of the earth do the sun's rays reach at each of these times?

Arctic region is in the midst of its longest day and summer, while the Antarctic is wrapped in the darkness of its long winter night. Why? In what direction from us does the sun rise and set at this time?

After this the sun again seems to turn, this time moving southward. Year after year, as the earth revolves around the sun, exactly these changes take place.

Boundaries of the Zones. — The *amount* of inclination of the earth's axis has not been stated, but you have no doubt discovered that that is a matter of very great importance.

In considering the amount, it is necessary to speak of angles. Angles may be measured by the use of circles. A right angle, for instance, is one that includes one-fourth of a circle between its sides (Fig. 16). It is customary to divide circles into parts, or *degrees*

(indicated by the sign $^{\circ}$), the number chosen being 360, a number which is exactly divisible by numerous other numbers, as 2, 3, 4, 5, 6, 8, 9, 10, 12, etc. Since a right angle includes one-fourth of a circle, it contains one-fourth of 360° , or 90° ; and an angle that is one-half as large as a right angle contains 45° . By drawing lines from the centre of a circle to its circumference, construct an angle of 90° ; and others of 120° , 45° , and $22\frac{1}{2}^{\circ}$.

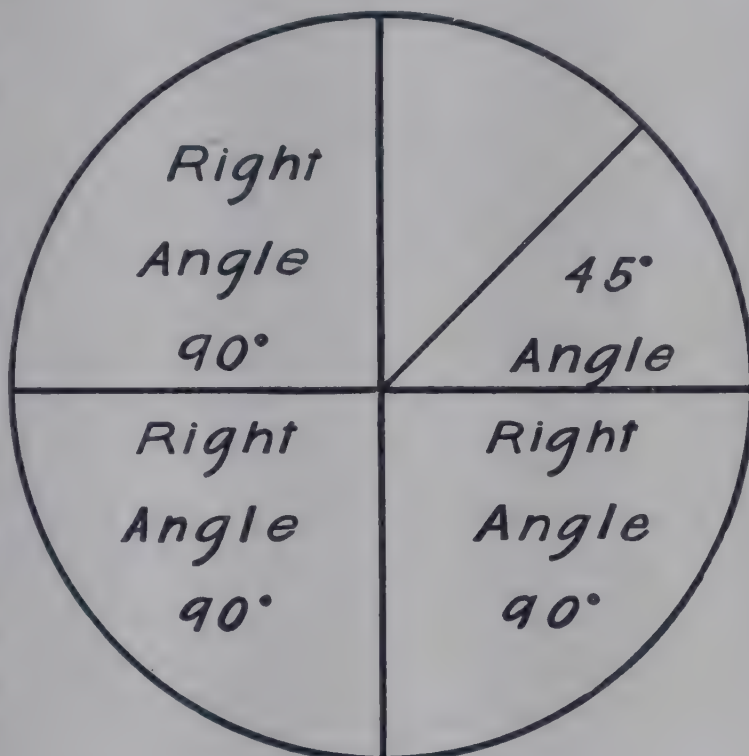


FIG. 16.

To illustrate the meaning of angles.

The angle in Figure 17 is $23\frac{1}{2}^{\circ}$, and shows just how far the pencil (Figs. 6–9) should be inclined. Hold

your pencil perpendicular to the top of the table; now tilt it about $23\frac{1}{2}^{\circ}$. That is the position of the earth's axis

with reference to the plane of its orbit, and year after year it remains at that angle.

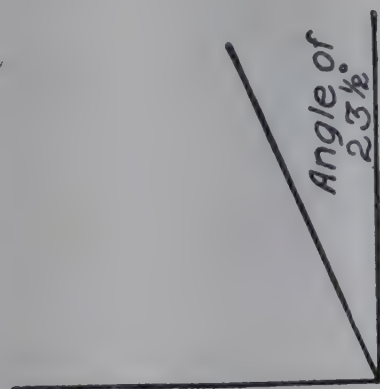


FIG. 17.

An angle of $23\frac{1}{2}^{\circ}$ drawn in a right angle.

This is the reason why the tropics and polar circles are situated just where they are. On June 21, when the north pole is turned toward the sun, the vertical rays fall $23\frac{1}{2}^{\circ}$ north of the equator, because the axis is inclined that amount. On that account the

Tropic of Cancer lies $23\frac{1}{2}^{\circ}$ north of

the equator. At this date, also, the sunlight reaches the same number of degrees beyond the north pole, and therefore the Arctic Circle is located $23\frac{1}{2}^{\circ}$ from the pole.

On December 21 the earth's revolution has caused the north pole to turn away from the sun, and the vertical rays then fall $23\frac{1}{2}^{\circ}$ south of the equator, while the sunlight reaches the same distance beyond the south pole. Thus

the Tropic of Capricorn and the Antarctic Circle are

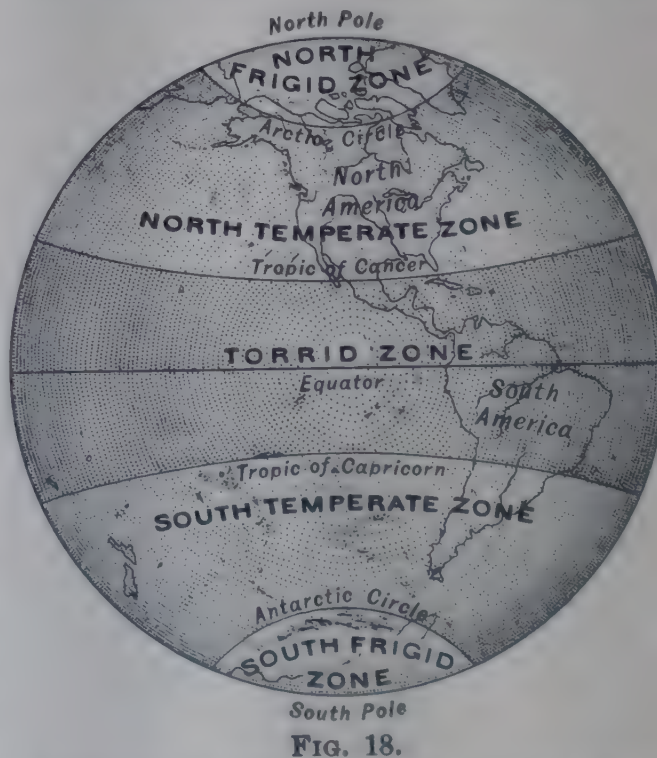


FIG. 18.

A map of the zones. Make a drawing similar to this.

located. It is plain, therefore, that the inclination of the earth's axis determines the exact boundaries of the zones.

Show each zone on a globe and point out its boundaries (Fig. 18). What is the width of each in degrees? Find the approximate width in miles. (Each of these degrees is about sixty-nine miles.) What is the direction of the sun's rays in each zone, and the resulting temperature? Should you expect to find a very different temperature in moving across the boundary line between two neighboring zones? Why?

REVIEW QUESTIONS. — (1) What is the earth's axis? (2) What was formerly believed about the earth's movement? (3) In what direction does the earth rotate? (4) What changes in the stars result from the earth's revolution? (5) What other effect of revolution is noticeable? (6) With a pencil, illustrate the movement of the earth around the sun (Figs. 6-9). (7) What is the earth's orbit? (8) What is the plane of the earth's orbit? (9) How are we affected by these positions of the earth? (10) Describe the position of the earth, the length of day, etc., on September 23. (11) On December 21. (12) March 21. (13) June 21. (14) How may angles be measured? (15) Give examples. (16) How much is the axis of the earth inclined? (17) How does this inclination of the earth's axis serve to fix the boundaries of the zones?

SUGGESTIONS. — (1) Find out why the earth is slightly flattened at the poles. (2) What might be some of the effects if each rotation lasted longer than twenty-four hours? (3) If much less? (4) At what time of day does your shadow always point directly north? (5) Notice how your shadow changes with the season in early morning. At noon. In the evening. (6) Tell about the direction and length of a man's shadow at noon on December 21st, at various points between the poles. (7) On June 21. (8) On September 23. (9) How long is our longest night? Our shortest? (10) Make a sketch of the eastern and western horizons as seen from your home. On it locate the position of the rising and setting sun at different times of year. (11) Which zone experiences the slightest change of seasons? Why? (12) What advantages and disadvantages do you see in that fact for people living there? (13) Is it once or twice each year that the vertical rays of the sun fall upon any one place in the Torrid Zone? (14) What might be the effect of a greater inclination of the earth's axis? Of a less inclination?

III. MAPS. (LATITUDE AND LONGITUDE)

To aid in locating cities, lakes, and other points on the earth's surface two sets of circles are used, one extending east and west, the other north and south. When maps of any part of the earth's surface are made, these circles are drawn on them. In a study of the earth they are of much the same advantage as the names and numbers of streets when one is finding his way in a large city.

Latitude. — The circles which are extended around the globe in east and west directions are called *circles of latitude* (Fig. 19). The

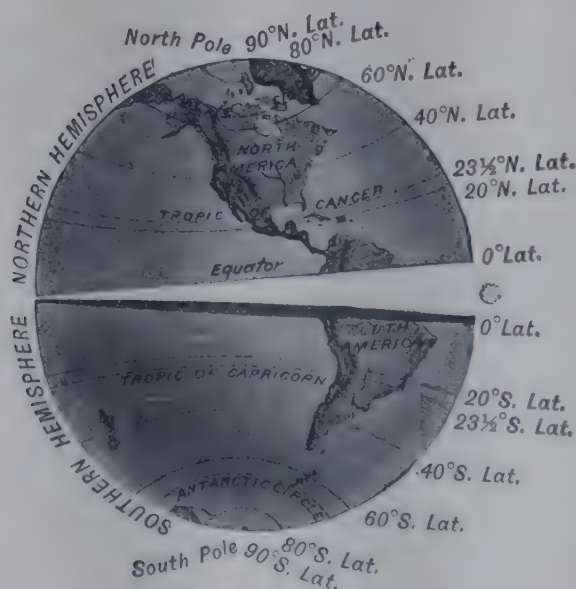


FIG. 19.

The globe, showing the two hemispheres and some of the circles of latitude.

two tropics and the Arctic and Antarctic circles are examples, and there are many others. In order that they may be of use they must be numbered. Accordingly, the *equator*, or the circle which is midway between the poles, is called 0° latitude. All circles north of this, that is all in the northern hemisphere, are said to be in north latitude; all south

of it, or in the southern hemisphere, are in south latitude. Since these circles are parallel to each other, they are often called *parallels* of latitude.

It has been said (p. 15) that a circle may be divided into 360 parts, or degrees. One-fourth of 360 is 90; and since the distance from the equator to either pole is one-fourth of that around the earth, there are just 90° from the equator to either pole. Accordingly the circles of latitude in each hemisphere are numbered from 0° at the equator to 90° at the poles. Since the circumference of the earth is about 25,000 miles, dividing that by 360 makes the length of each degree of latitude about 69 miles. Therefore latitude is merely distance from the equator.

What cities in the United States are near the fortieth parallel of north latitude? What is the latitude of Key West? Of New York? Of Madrid in Spain? Of Peking? Of Kimberley in South Africa? Of the Tropic of Cancer? Of the Tropic of Capricorn? Of the Arctic Circle? Of the Antarctic Circle?

Longitude. — It is evident that the distance of any place north or south of the equator can be easily found by the use of circles of latitude. But of course there must be some means of locating points in east and west directions also. This is made possible by the use of *meridians*, or circles extending northward and southward across the equator.

Notice on Figure 21 how the meridians converge toward the poles, coming nearer and nearer together until they finally reach the poles. Since they meet at these two points, though spreading far apart at the equator, it is plain that they *cannot be parallel* (Fig. 20). Degrees of longitude, therefore, are not of the same length in all places. At the equator, which is 25,000 miles in length, each of the 360° is about 69 miles; but where the meridians cross

the smaller Arctic Circle, the length of a degree of longitude is much less.

To number the circles of longitude, a *prime* or *zero meridian* must be selected from which to commence. The one most commonly chosen for this purpose is that passing through Greenwich near London. All circles of longitude east of this meridian are numbered as *east*

longitude (E. Long.) until the opposite side of the earth, or meridian 180° , is reached (Fig. 21). All west of the Greenwich meridian, as far as 180° , are numbered as *west longitude* (W. Long.).

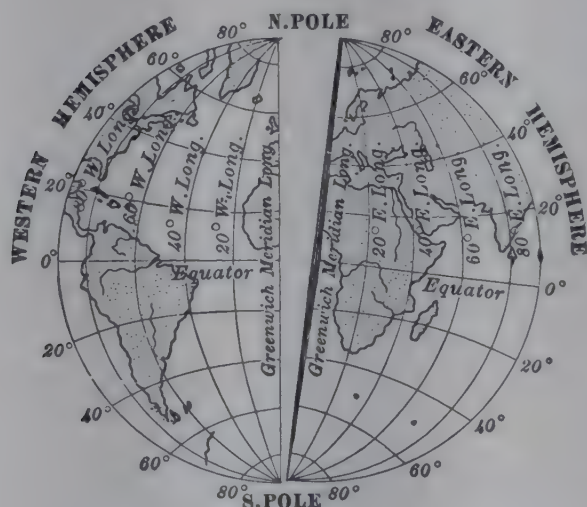


FIG. 20.

The earth, cut in halves along the Greenwich meridian, showing some of the meridians.

longitude as well as circles of latitude. Why must the meridian marked 180° E. Long. be the same as the one marked 180° W. Long.? Which meridian passes near New York? Denver? Vienna? Jerusalem?

Find the latitude and longitude of Chicago. Of New Orleans. St. Petersburg. Rome. Peking.

If a large map is made of a small part of the earth, the circles of latitude and longitude are too far apart to be of much use. Therefore, it is customary to divide each degree into sixty parts called *minutes*, just as each hour is divided into sixty parts. Each minute of latitude and longitude is divided into sixty parts called *seconds*, as each minute of time is divided

into sixty seconds. The sign for a degree is $^{\circ}$; for a minute $'$; for a second $''$. Thus 60 degrees, 40 minutes, and 20 seconds north latitude is marked $60^{\circ} 40' 20''$ N. Lat. Examine some map of a small section to find these signs.

Longitude and Time. — The meridians are of use in determining time also. When it is noon at one point on a meridian it is noon at all other places along the same meridian. For example, when it is noon at your home, it is midday at all other places which are exactly north or south of you. Just one twenty-fourth of the distance around the world to your east, that is 15° east of you, it is exactly one hour later. What is true on your west?

You will recall that the United States is divided into belts of Standard Time (Fig. 22), each belt having the time of its central meridian. These central meridians are taken 15° apart, so that the difference in time between adjoining belts is exactly one hour.

In order that the system may accord with that of other parts of the world, the time of the Greenwich meridian is taken as the basis. Thus the whole world, like the United States, may be divided into standard time belts, with a change of an hour at every fifteenth meridian.

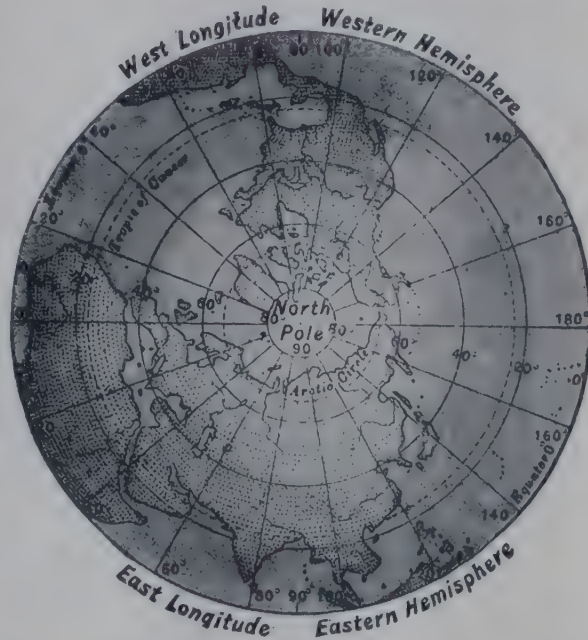
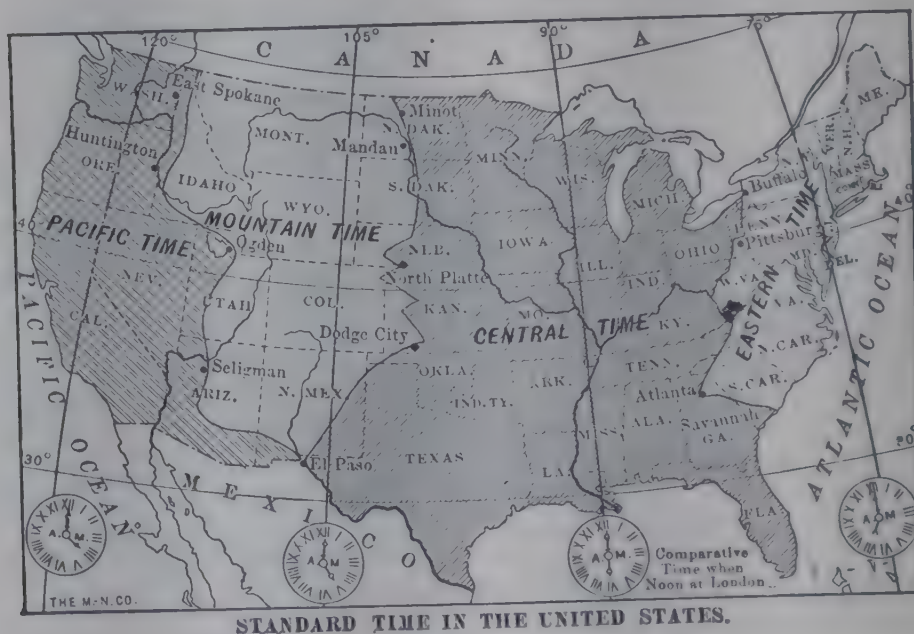


FIG. 21.

To show how the meridians converge at the pole. Trace the 0° meridian to the opposite side of the globe. What is it numbered there? Trace some of the others.

Maps of the World.— When we wish to represent the earth accurately we must use a globe; but this involves so many inconveniences that geographers have invented other kinds of maps. However, the fact that the earth is a sphere makes it impossible to draw flat maps of large sections without some distortion. You can understand the difficulty if you try to flatten the half of a hollow



STANDARD TIME IN THE UNITED STATES.

FIG. 22.

Standard time belts of the United States. Find the central meridian for each time belt. Why are the actual boundaries of these belts so irregular?

rubber ball upon a table. You could not possibly do this without stretching it out of shape along the edges.

A *small* part of the earth is so nearly flat that it may be represented on a map without distortion, but when half of the whole earth is to be shown there is much distortion. For example, in a map of the hemispheres (Fig. 20) you can easily see that the meridian in the centre is shorter than those on the outside; but on a globe all the meridians are of the same length, since all reach from

the equator to the poles. On such a map, therefore, lands at the edge must be represented as longer from north to south than those near the central meridian.

A map of the whole earth, like Figure 25, is called a

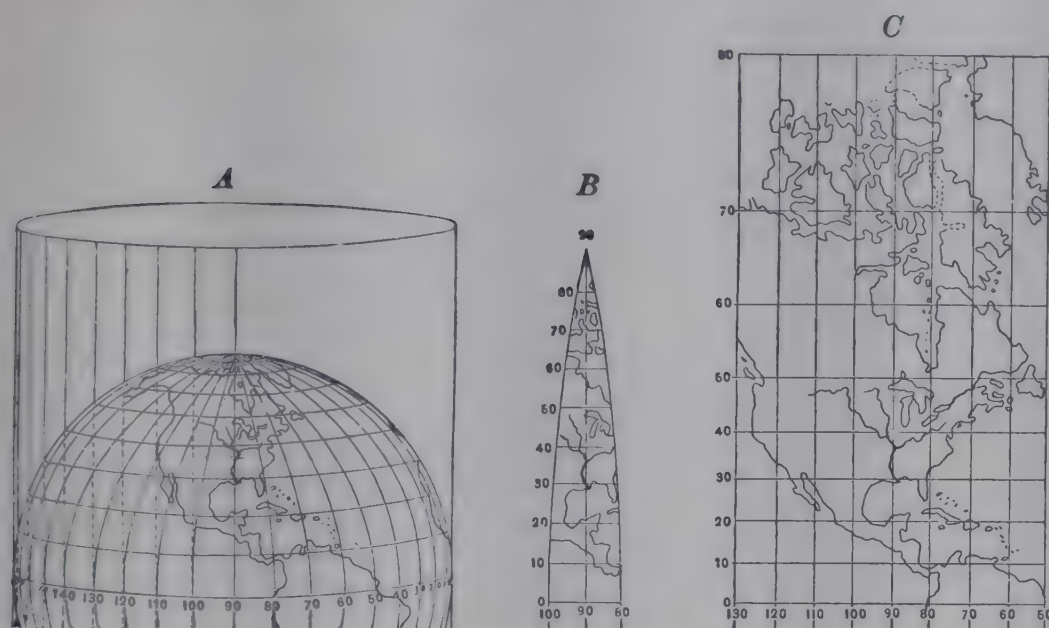


FIG. 23.

To illustrate the distortion on Mercator maps. *A* shows a globe with the meridians converging at the pole. *B* shows three of these meridians coming to a point at the north pole, as they do on a globe. For a Mercator map these meridians are spread apart and made parallel as they would be on a cylinder (a cylinder is drawn around the globe in *A*) rolled out flat, as in *C*. This, of course, distorts the lands, making them too broad in the north. Compare *A*, *B*, and *C*, to understand that this is so. Notice, also, that the parallels of latitude are drawn farther apart toward the north.

Mercator map, after the man who first made one. It is drawn as though the lands and waters near the poles were stretched out until the meridians are parallel. At the same time all the parallels of latitude are made as long as the equator. (See Fig. 23.)

In a Mercator map, the farther you go from the equator, the more the lands are distorted. Greenland, for instance, and

northern North America and Eurasia, are greatly exaggerated in breadth. Also the Arctic Ocean looks like a long extent of water, instead of a great gulf opening from the Atlantic, which it really is. On such a map the poles themselves cannot be shown at all.

There are other ways of representing a part or all of the earth. For example, see Figures 3 and 29. Compare the different maps of this book to see how the form of continents varies in those drawn after different plans. From these statements you can see how very important it is to use a globe frequently, in order to keep in mind the real shape of the continents.¹

REVIEW QUESTIONS.—(1) By what lines are places on the earth's surface accurately located? (2) How is latitude indicated on maps? What is latitude? (3) What is the starting point for measuring it? (4) What is the length of a degree of latitude? How is it determined? (5) How is longitude indicated? What is longitude? (6) What is the starting point for measuring it? (7) What is the length of a degree of longitude at the equator? Why? (8) How are the meridians numbered? (9) What subdivisions of degrees are there? Why are they necessary? (10) How does the time change in going eastward? Westward? (11) Tell about Standard Time in the United States. (12) Why is it difficult to make accurate maps of large parts of the earth? (13) In what way are hemisphere maps distorted? (14) Mercator maps?

SUGGESTIONS.—(1) Compare the latitude of the most southern point in the United States with the most southern point in Europe. (2) Compare the longitude of eastern United States with that of western South America. (3) Find some places that have nearly the same latitude as your home. The same longitude. (4) Ask a surveyor to tell you the exact latitude and longitude of the city hall, or your town centre. (5) Show on a globe or map where a ship would be in the Atlantic when in zero latitude and longitude. (6) What city is about 45° N. Lat. and 93° W. Long.? (7) What islands are nearly 14° N. Lat. and 145° E. Long.? (8) Since the sun's rays travel over 15° of longitude in an hour of time, how many minutes of longitude do they travel over in one minute of time?

¹ *Small globes are so cheap that every school should have at least one.*

IV. WIND AND RAIN BELTS

One great lesson of geography is that all nature is bound together. Each force influences others, and all of the forces together affect not only the plants and animals of the earth, but the life of man himself. For example, it is because of the earth's form and motions that the sun's heat is distributed in belts which change with the seasons. In turn these different zones of heat have determined the great belts of winds and the distribution of rainfall. If we would clearly understand life conditions upon the different continents, we must know about these belts of wind and rain.

WINDS

Cause of Winds. — The principal cause of winds is illustrated every time a fire is kindled. The flame warms the air and causes it to expand and grow lighter. This lighter air is then forced to rise by the pressure of the colder, heavier air round about, which pushes in underneath, and, by crowding the warm air upward, produces a draught. So long as the fire burns, this movement is kept up.

The winds of the globe are produced in a similar manner. Whenever the air is cooler in one place than in neighboring regions, the cool, heavy air settles down, flows beneath the warmer air and slowly raises it. Then the warm air, which has been lifted, flows out and away at a higher altitude. Thus, either in the case of a gentle breeze or of a violent hurricane, we may think of *four*

directions of movement of the air. Illustrate them by a drawing.

The Wind Belts. — So long as the vertical rays of the sun produce a heated belt near the equator, with cooler air to the north and south where the rays are slanting, there must be an extensive system of winds on the earth. From the cooler regions on the two sides, the air flows steadily toward the central part of the heated belt, producing the *trade winds* (Figs. 24 and 25). As the trade winds approach the central line of the heated belt, or the

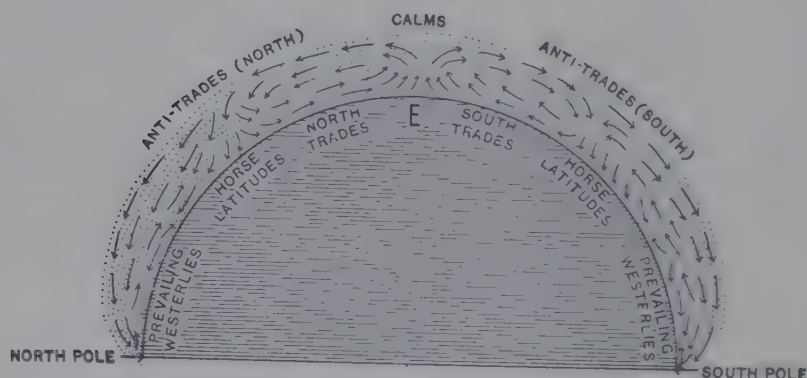


FIG. 24.

Diagram to show, by arrows, the movement of the greater winds of the earth.

heat equator, they travel more slowly. Then, owing to expansion from heat, and to pressure from the colder air behind, the air rises over a broad area to a great height. In this belt of rising air, whatever winds are felt are light and changeable, and calms often prevail; hence the name *belt of calms*.

At an elevation of several thousand feet this air flows outward, above the trade winds, toward the poles, producing the *anti-trades* (Fig. 24). About a third of the distance to the poles, near latitude 30° , much of the air of the anti-trades settles to the earth again, near the place where the



FIG. 25.
A diagram to show the principal wind belts of the earth.

trade winds begin. Since the movement of the air here is downward, there can of course be little wind in this belt, which is known as the *horse latitudes* (Figs. 24 and 25).

If the earth did not rotate, the trades and antitrades would no doubt follow the meridians directly toward and away from the equator; but rotation turns them from their course, to the *right* in the northern hemisphere, and to the *left* in the southern. Thus the trade winds blow from the northeast and the southeast, while the anti-trades return in the opposite directions at higher altitudes.

Beyond the horse latitudes much of the air of the anti-trades flows on toward the poles as westerly winds, both high in the heavens and at the surface. Travelling onward, and coming into smaller and smaller space as the poles are approached, portions of the air continue to turn back toward the equator, while the remainder sweeps on as westerly winds. These are plainly felt in the United States, Canada, northern and central Europe, and over the great Southern Ocean; and since the *prevailing* winds over these vast areas are from the west, these belts are known as the regions of *prevailing westerlies* (Fig. 25).

The great wind and calm belts that encircle the earth are not always in exactly the same place. As the vertical rays of the sun move north and south from tropic to tropic, the zone of greatest heat must follow. So the belts of heat, and therefore of winds (Figs. 31 and 32), change their positions every year, shifting northward in summer and southward in winter.

RAIN

Causes for Rain. — Knowing the wind belts that encircle the earth, we have a key to the principal rain belts;

for winds are the water carriers of the earth. Water which is evaporated from the surface of the oceans and lands, is borne along in the air. As rain or snow it descends to the earth, abundantly along most coasts, and, usually, less liberally toward the interior of the continents.

It is an important fact that there can be more water vapor in warm than in cool air. Therefore, whenever air is cooled sufficiently some of the water vapor which it bears is condensed. For example, vapor condenses on an ice-water pitcher because the air next it is cooled; and dew forms on grass when the air near the ground grows cool in the evening. In a like manner the vapor in our breath forms a little cloud when the breath in winter is cooled by mixture with the cold outside air.

Rain is usually caused by the cooling of air which is rising to higher levels and therefore expanding. When you open the valve of a bicycle tire, the outrushing air expands and grows cool; and if you place your finger over the valve, you can feel the coolness. In a similar way, when air rises above the surface of the earth it expands because there is less air above to press upon it. Then it grows cool; and while doing so some of its vapor may be condensed to form clouds and raindrops. So whenever air from the damp oceans is rising over highlands, or whenever it is being raised over warm lands by the cooler air that pushes underneath, as in the belt of calms, rainfall naturally results. Briefly, — *when air rises, it expands and cools; and then rain commonly follows.*

On the other hand, air that is settling grows warmer, and instead of giving up its vapor, it becomes dry and clear. This may again be illustrated by reference to the



FIG. 26.

The rainy belt of calms of South America. Also the rainy east coasts and arid west coasts of the trade-wind belts.

mosphere above. Since there can be more vapor in warm than in cool air, when air flows down the mountain slopes, or descends from high altitudes, as in the horse latitudes, clouds disappear and water is evaporated from the

bicycle; for when air is pumped into the tire, the pump becomes warm as the air is compressed. In a like manner, air that is descending toward the earth's surface is compressed and warmed because of the increasing pressure of the at-

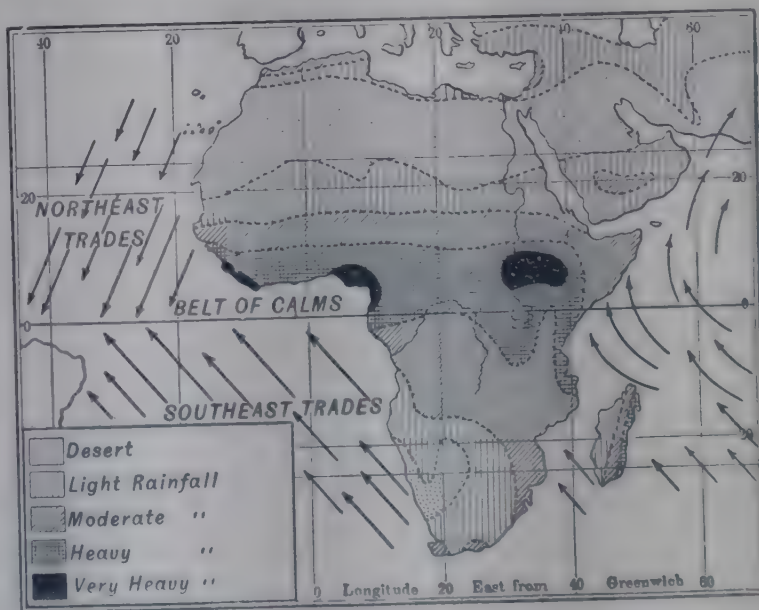


FIG. 27.

To illustrate the desert regions in the trade-wind and horse latitude belts of Africa. Also to show the heavy rainfall in the belt of calms. Find the similar belts on Figures 26, 28, and 30.

ground. Briefly, — *when air descends, it becomes denser and grows warmer; then the sky is clear and the weather dry.*

Rain Belts. — The belt of calms is the most rainy belt of the earth (see Figs. 26, 27, and 28), because its hot, moisture-laden air is rising and cooling. After a clear night in that region, the sun usually rises in a cloudless sky. As the morning advances and the heat grows more intense,

the damp air rises more rapidly; then small clouds appear and grow steadily until rain falls from them. Showers occur practically every day, increasing in the afternoon.

When the sun sets and the air rises less actively, the clouds melt away, the

stars appear, and the night is as clear as before. Our hot, muggy summer days, with heavy thunder showers in the afternoon and evening, illustrate the weather that is repeated day after day in this belt of calms.

Since the trade winds blow from cooler to warmer regions, and are therefore steadily growing warmer, their air tends to take up moisture rather than to drop it. The



FIG. 28.

Showing the heavy rainfall on the east-facing coast of Australia where the trade winds blow. Notice also the arid interior and west coast. What is the condition in the belt of calms? What resemblance do you see to Figure 30?



FIG. 29.

A rainfall map of the world. In which of the wind belts (see Fig. 25) do we find the heaviest rainfall? On which coasts? Where are the deserts? Explain the location of those on each continent. Why should there be more desert in Africa than in South America?

trades commence on the edge of the horse latitudes, where the descending air is also growing warmer and evaporating moisture. Thus both north and south of the rainy belt of calms there is a belt of little rainfall. Within these belts are the Sahara and most of the other desert regions of the earth. Point them out in Figures 26, 27,

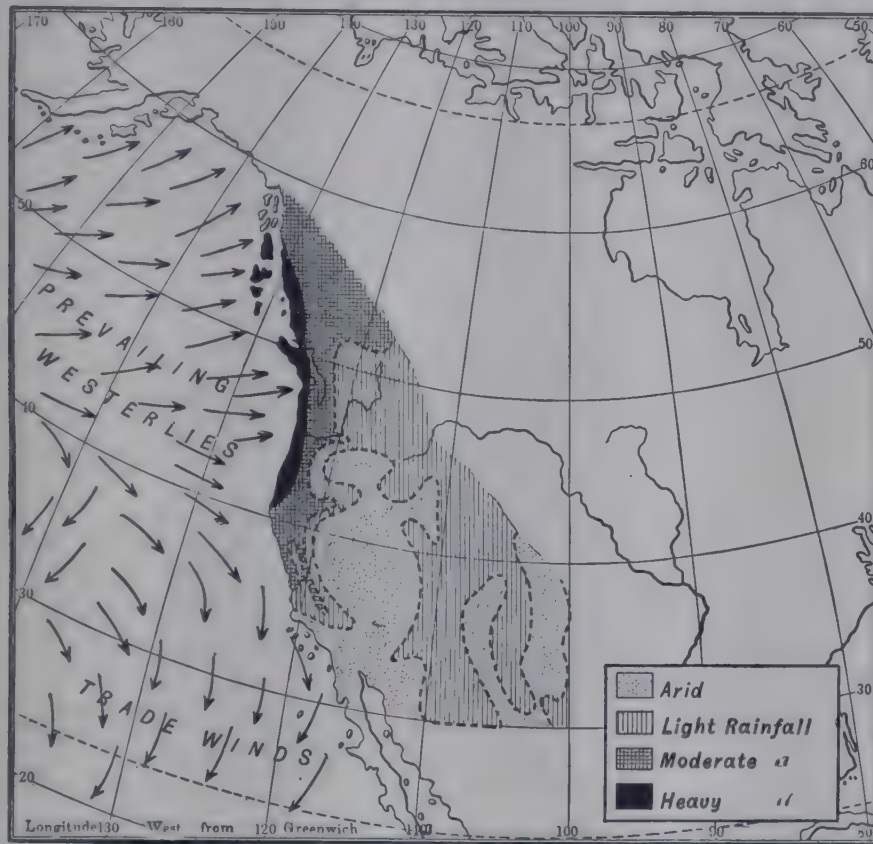


FIG. 30.

The heavy rainfall where the prevailing westerlies blow over the rising coast. What is the condition farther east? What is the case where the trade winds blow? Why?

and 28. Which of our Pacific Coast States is partly in the horse latitudes? (Fig. 30.)

Although the trades are *drying* winds, they obtain much vapor when they pass over the ocean. Therefore, wherever they blow from the ocean upon the rising slopes of the land, and especially upon mountain slopes,

the moist air is cooled in rising, and abundant rain falls. Owing to this, the eastern or *windward* slopes of lands in the trade-wind belts have abundant rainfall, while the western or *leeward* slopes, and the level interiors of continents, have little. Notice how clearly this is shown on the rainfall maps (Figs. 26 to 30). What sections in North America are thus affected?

In the broad belts of westerly winds, where the air rises over western coasts and islands, there is heavy rainfall. Find examples in Figures 28 and 30. On the other hand, slopes further east, in the interior, receive little rainfall from such winds and may even be deserts (Fig. 30). Name some of our states that are thus made arid.

Migration of the Rainfall Belts. — Since the belts of heat, and therefore of winds, shift north and south each year (p. 28), many places have heavy rainfall at one season and dry air at another. In the torrid zone, for example, many places are within the belt of calms during the summer of their hemisphere, and are swept by the drying trades in their cooler months (Figs. 31 and 32), thus dividing the year into wet and dry seasons.

Monsoons. — We have thus far studied the great wind belts, and the rain belts that are dependent upon them. But in many regions these regular winds are greatly interfered with, and the rainfall must consequently be affected. One of the chief sources of such disturbance is the difference between the temperature of land and water.

Land warms and cools much more quickly than water. How hot the stones feel in summer compared with pond water! And how quickly the ground freezes in autumn, while we are still waiting for skating on the ponds! Likewise in summer the continents are warmer than the oceans; in winter, cooler.

Places in the interior of continents, far from the ocean, naturally have the greatest extremes of temperature. During the winter, the heavy air over the cold land settles

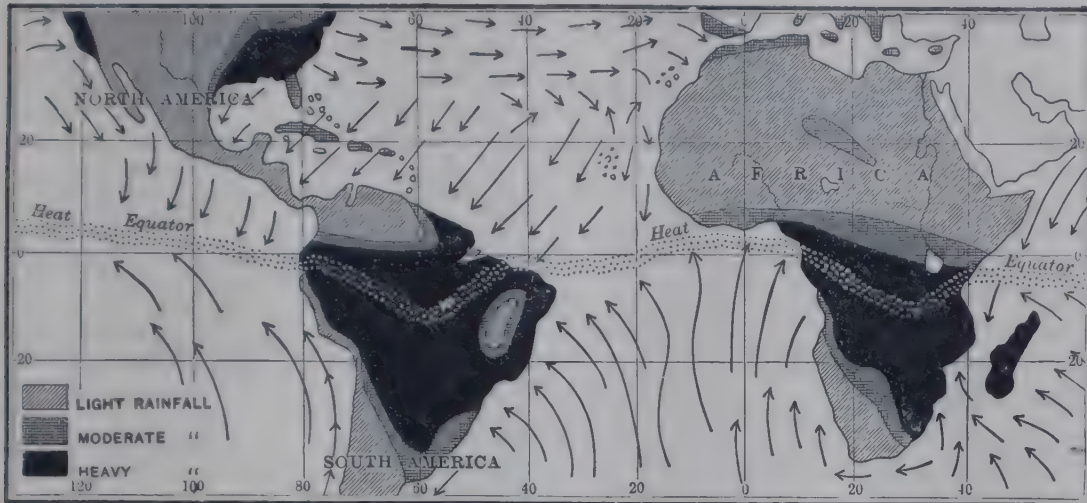


FIG. 31.

Winds and rainfall in South America and Africa from December to February.

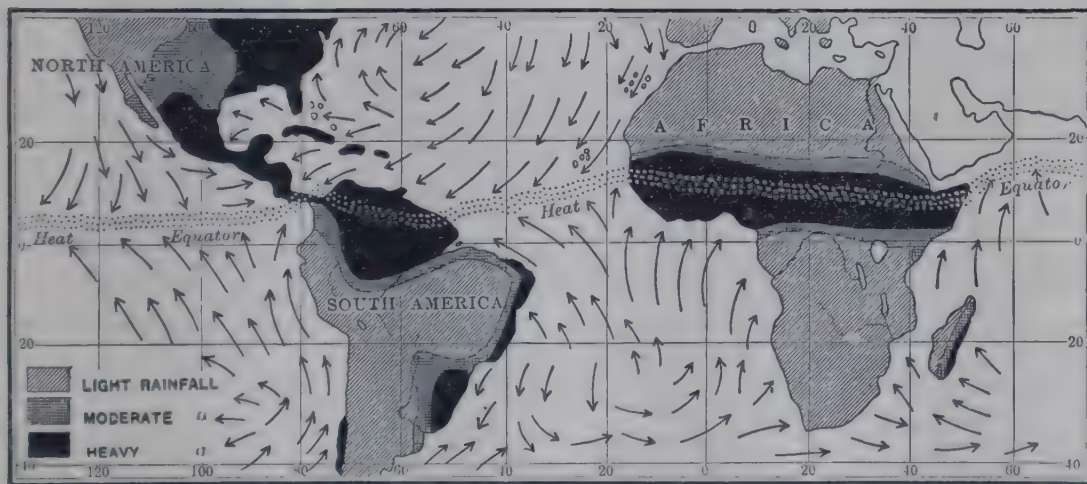


FIG. 32.

Winds and rainfall in South America and Africa from June to August. Compare with Figure 31 to see how the belts of heavy rain have migrated as the wind belts have shifted with the change of season.

down as drying air, and presses outward beneath the warmer air which lies over the oceans. This produces dry land winds. In summer, on the other hand, the air

over the cool waters crowds in, raises the hot air of the continents, and produces ocean winds and rain. This is well illustrated in the southern part of Asia. Heated by the nearly vertical rays of the sun during the northern summer, the land there becomes warmer than the ocean. Toward this heated area the cooler air from over the Indian Ocean crowds in, causing ocean winds.

This makes the summer winds opposite in direction to those of winter when the air is flowing out toward the

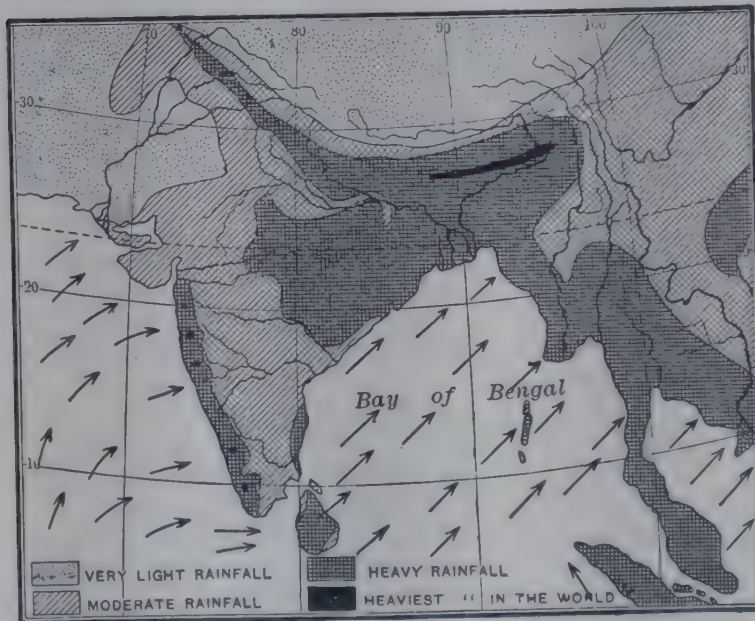


FIG. 33.

The winds and rainfall during the summer monsoon of India.

warmer Indian Ocean from the cold lands of interior Asia (Fig. 34). Winds of this kind, which blow in opposite directions in different seasons, are better developed in India than in any other part of the earth, and it was there that

they received their name, *monsoon* winds. The term monsoon is now applied to inward-flowing summer winds and outward-flowing winter winds of any large mass of land.

When the summer monsoons blow, the rainy season comes in India (Fig. 33). The rainfall is especially heavy where the moisture-laden air rises up the steep slope

of the Himalayas. In one part of this district, opposite the head of the Bay of Bengal, there is three times as much rain in July alone as falls in well-watered portions of the United States during the entire year. The winter monsoon, on the other hand, is so dry that vegetation withers and the soil becomes parched and cracked, as in a desert (Fig. 34).

While the north and south temperate zones are both called *temperate*, and have many features in common, they are quite unlike in some respects. In the northern hemisphere the broad continents become very hot in summer and cold in winter. Since the temperature of the oceans remains more uniform, the regular winds are greatly interfered with, as by the monsoons. In the south temperate zone, on the other hand, there is little land and a vast expanse of ocean. The temperature of the water changes but little, and the narrow lands have their temperature largely determined by winds from the oceans. In the south temperate zone, therefore, there is little chance for winds between land and water to change the course of the westerly winds. Hence the west winds blow much more regularly there than in the northern hemisphere. Sailors call these inclement southern latitudes the "roaring forties," and shun

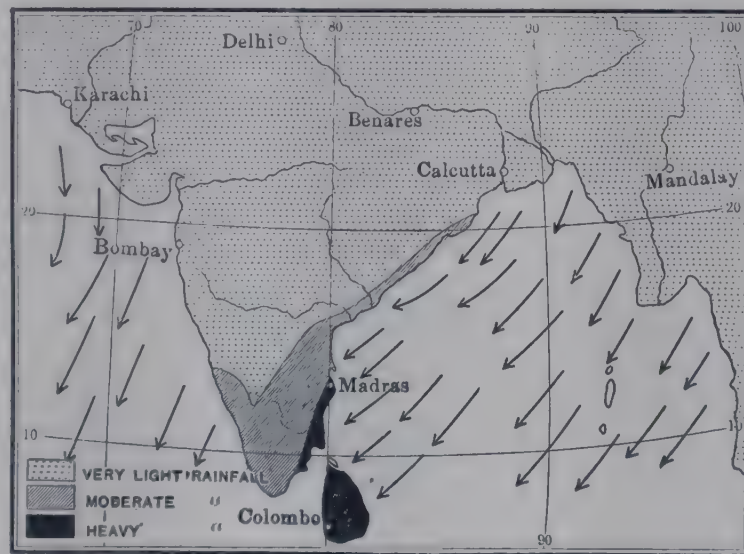


FIG. 34.

Map of the winter monsoon winds and rainfall of India. Compare with Figure 33, and notice especially how very light the rainfall is in one season and how heavy it is in the opposite season.

the stormy voyage around Cape Horn, where the west winds blow with wonderful steadiness.

Cyclonic Storms. — There is another great source of disturbance of the regular winds, which we studied about in the

preceding book.

It was learned there that in northern United States and southern Canada there appears, every few days, an *area of low pressure* where the air is lighter than that over the surrounding region. Toward such a low-pressure area heavier air from the surrounding country hurries, even from distances of hundreds of



FIG. 35.

A cyclonic storm in Europe which came from the ocean. The heavy black line shows the course followed by its centre. Notice how the winds blow toward the centre.

miles. Thus winds are caused which on the south side blow from the south, on the east side from the east, etc.

Owing to the earth's rotation, these winds are turned from their straight course and therefore move spirally toward the centre of low pressure. On nearing this centre the air rises, and as it does so the vapor condenses, forming

clouds and rain. Such great, whirling eddies of air, with their accompanying clouds and rain, are known as *cyclonic storms*. It is these that cause most of the rainfall of northeastern United States and Canada.

We learned further, that instead of remaining in one place, the cyclonic storms steadily travel onward, usually beginning in the northwest or southwest and *always* passing eastward. They generally follow the Great Lakes, pass down the St. Lawrence, and then out upon the ocean, which they frequently cross, even entering Europe. Indeed, they sometimes travel far into Asia before finally dying out.

Since the movement of their centre is always eastward, these storms are doubtless a part of the prevailing westerlies. But since they are composed of currents of air from all directions, they are a source of numerous disturbances in the lower layers of this great eastward drift of air. Indeed, they resemble eddies in a river, where the water of the eddies is whirling around in various directions, though the general current of the river is down stream.

In Europe and western Asia, as in America, the extent of the country upon which rain may be falling from the clouds of one of these storms is sometimes very great. Places hundreds of miles apart may be receiving rain at the same time. In Eurasia also, as in America, the weather is made changeable by these storms. That is, in any particular locality it may be warm and pleasant one day, stormy the next, then clear and cool or cold. Similar cyclonic storms develop in the prevailing westerly belt of the southern hemisphere, where they bring changes of weather to southern South America, Australia, and the islands of the great Southern Ocean.

REVIEW QUESTIONS. — (1) Why should we study about winds? (2) Explain the cause of wind. (3) Explain the trade winds. (4) Tell about the belt of calms. Locate the belt. (5) Explain the anti-trade winds. (6) Where are the horse latitudes? How about the wind there? (7) What directions are taken by trades and anti-trades? Why? (8) What are the prevailing westerlies? Where felt? (9) Why do these belts of wind shift north and south each year? (10) Explain how it happens that when air rises, rain commonly follows. (11) Also, why, when it settles, dry weather results. (12) Tell about the rainfall in the belt of calms. (13) In the trade-wind belts. (14) In the horse latitudes. (15) In the belt of prevailing westerlies. (16) Why do some places have both a rainy and a dry season each year? (17) Explain monsoons. (18) Where are they best developed? (19) What is their influence on rainfall? (20) Why are the winds in the northern hemisphere less regular than those in the southern? (21) Tell about cyclonic storms in the United States. (22) In Eurasia.

SUGGESTIONS. — (1) Make a drawing to show the direction of the regular winds of the world. (2) Watch the higher clouds to see in what direction they are moving. (3) Explain what is meant by a rainfall of sixty inches. (4) Measure the amount of rain that falls in a wash-tub during a single storm. (5) Write a clear statement of the reason why there are desert belts both north and south of the equator. Give examples. (6) Examine and explain some maps issued by the Weather Bureau. (7) Observe and record the changes in wind direction, temperature, and rainfall during the passage of a cyclonic storm. (8) Read the chapter on cyclonic storms in Tarr's First Book of Physical Geography, pp. 102-125.

V. DISTRIBUTION OF TEMPERATURE AND A STUDY OF OCEAN CURRENTS

DISTRIBUTION OF TEMPERATURE

Although you have studied about *belts* of wind and rain, you have noted that there are many irregularities and exceptions. This is due to the fact that the boundaries of the heat belts are also irregular, as is shown by the isotherms¹ on the isothermal charts of the world.

If nothing else influenced temperature excepting distance from the equator, the isothermal lines would be parallel to the circles of latitude. In our study of North America, however, we have already learned that the temperature of a country is determined by several factors besides latitude. These are (1) *altitude*; (2) the *nearness to a large body of water*; (3) the *direction of the prevailing winds*; and (4) *ocean currents*. Let us see how each of these causes interferes with the regularity of the isotherms.

Effect of Highlands. — Mountains are colder in both summer and winter than low lands in the same latitude. Therefore, in crossing mountain chains the isotherms bend toward the equator. Our small maps do not show this.

Effect of Distance from Sea. — Comparing Figures 36 and

¹ An isotherm is a line connecting places having the same average temperature.

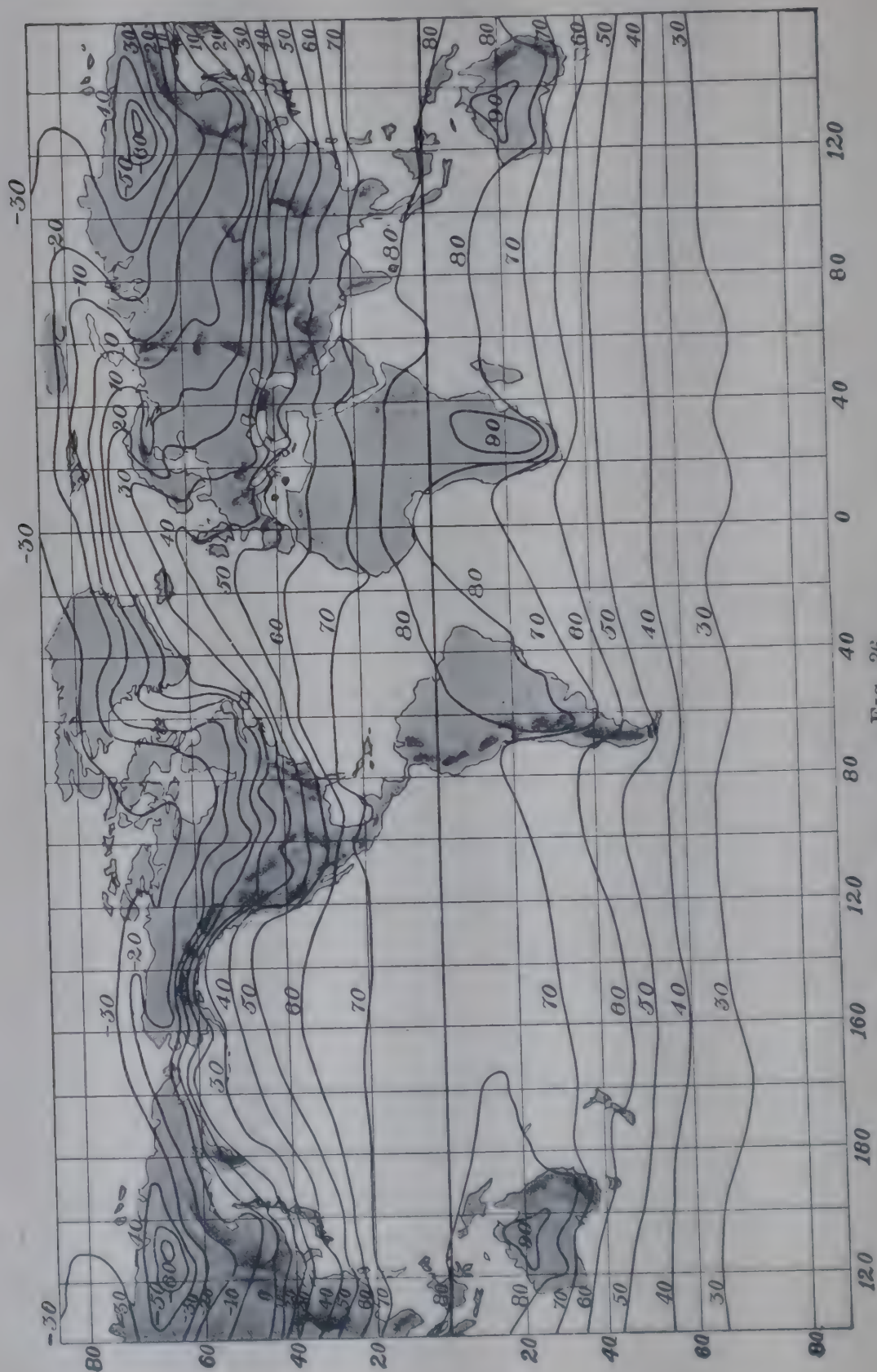


FIG. 36.

An isothermal chart of the world for January.

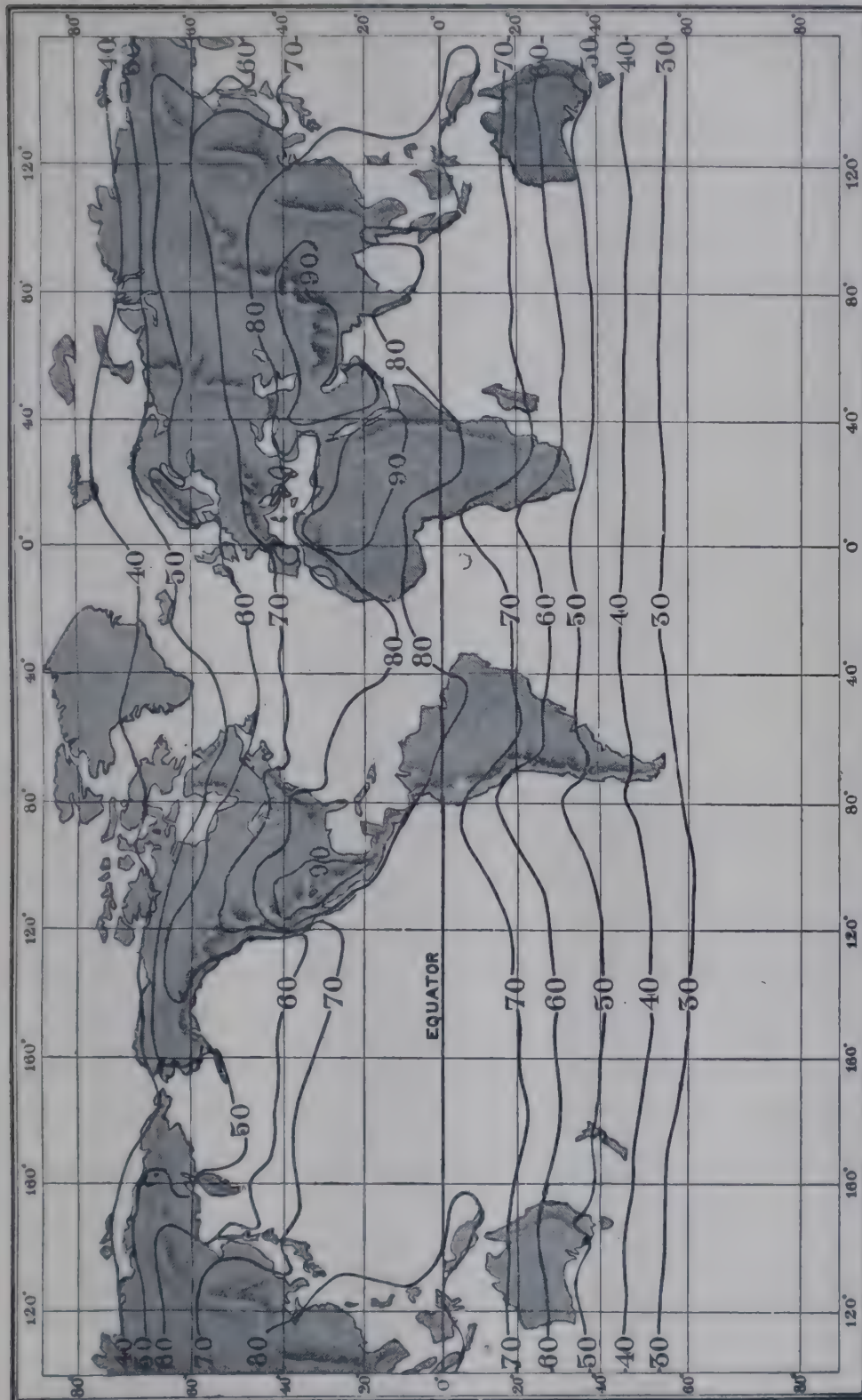


FIG. 37.
An isothermal chart of the world for July.

37 you will notice that the winter isotherms of the north temperate zone bend *toward* the equator over the continents because the land then becomes very cold. During the summer, on the contrary, the isotherms curve poleward, showing that the interiors are then warmer than the coast lands in the same latitude. This gives great temperature changes from winter to summer, as, for example, on the plains of the United States and Canada. Where else on the charts do you find similar extremes of temperature? In what continent is there a still greater seasonal change in temperature than in North America? Why?

Effect of Prevailing Winds. — Along the coast of western North America, from California to Alaska, the isotherms do not follow the parallels of latitude, as we might expect, but extend northward and southward almost parallel with the coast. The reason for this peculiarity is that the prevailing winds are the westerlies, which, blowing from the Pacific, bring to the land the nearly uniform temperature of the ocean. Can you find other windward coasts where a similar influence is exerted?

You will notice that there is only about 20° difference between winter and summer temperatures on the western coast of North America. But on the eastern coast of the United States the difference between summer and winter is much more marked, because, while some of the winds are from the ocean, still more are from the land, which is cold in winter and warm in summer. Compare the eastern and western coasts of Eurasia in this respect. Why does the southeastern coast of South America have less change from summer to winter than northeastern North America?

OCEAN CURRENTS

Cause of Ocean Currents. — There are also many variations in the course of the isotherms over the oceans. To explain these it is necessary to understand the ocean currents, which, you will remember, are caused by the winds. By blowing steadily over the surface of the water the winds not only set it dancing in waves, but also cause it to drift before them. This fact is illustrated by the currents along the northern shores of the Indian Ocean. In winter the waters flow southwestward, driven by the northeast monsoon; but during the summer monsoon, when the wind changes to the southwest, the currents are reversed, and there is a drift toward the northeast.

Knowing the direction of the regular winds, we can understand the course of the ocean currents. Were there no continents, the waters of the ocean would drift round the earth in two sets of opposite currents, eastward in temperate latitudes, where the prevailing westerlies blow, and westward in the trade-wind belts.

In the broad expanse of ocean to the south of Africa and South America, where there are no lands to check the water, there *is* a steady eastward drift of the water (Fig. 38). But where the oceans are partly enclosed between the continents, the great currents are so turned by the land as to form five vast eddies of slowly drifting surface waters, two north of the equator and three south of it. These bring enormous quantities of cool water into the torrid zone, so tempering the heat as to make that region habitable. And they also bear back toward polar latitudes stores of heat sufficient to adapt, to man's commerce and tillage, shores and lands that would otherwise be icebound.

The Pacific Currents. — In the Pacific Ocean the equatorial drift, caused by the northeast and southeast trades, moves toward the continents and islands of the Old World (Fig. 38). Upon approaching these lands the drifts are turned, a part to the south, a part to the north. Under the influence of the earth's rotation the southern current is turned to the left, the northern to the right. Thus the northern current swings past the East Indies and Japan, and, still turning under the influence of rotation, leaves the Asiatic coast and returns toward America, now driven by the westerly winds as a broad drift. Approaching British Columbia, most of the water continues to circle to the right, passing southward and, as it turns eastward again in the trade-wind belt, finally completing the great eddy of the North Pacific.

Where this drift crosses from Japan it is known as the Japan Current (Fig. 38). In its waters tree trunks and other tropical products are borne far away to the treeless islets northeast of Japan. The northward bend of the isotherms over the ocean (Fig. 36) suggests the enormous stores of heat which this current carries from the torrid zone. The westerly winds bear some of this warmth to the western slopes of Canada and the United States.

A small branch of the current turns northward along the Alaskan coast, and its warm waters temper the winds of Alaska. There is also a current between the Japan Current and the coast of Asia. But this is a drift of cold water from the north, as you can see by noticing how it bends the isotherms southward near the coast (Fig. 37). Winds from this cold current chill the Siberian coast, and cause the harbors, like that of Vladivostok, to be icebound in winter. This explains why Russia has leased the Chinese harbor at Port Arthur south of

Korea, as a terminus of the great Siberian railway, — that her commerce and war-ships might not be shut up in winter.

Eddies of the Southern Oceans. — In the South Pacific, South Atlantic, and Indian oceans, the same causes have produced eddies similar to that of the North Pacific; but here the earth's rotation deflects both winds and water currents to the left. Some of the water of these eddies joins the broad West Wind Drift of the distant southern ocean; but much of it turns northward until it once more reaches the trade-wind belt, thus completing the eddies.

The north-moving portion of these eddies brings cool water toward the equator and thus chills the ocean, and, therefore, the winds that blow upon the neighboring lands. On Figure 36 find some places where the isotherms bend northward, showing this effect of these currents. Where do they bend southward, showing that warm water is being carried from the torrid zone? Compare the isothermal and ocean current charts (Figs. 36, 37, and 38) to see which currents are responsible for this bending of the isotherms.

North Atlantic Currents. — In the North Atlantic the isotherms are even more irregular, and we readily see that the effect of the currents on the lands and peoples is more important. To value rightly these effects on life we should know their causes. Since the eastern angle of South America is south of the equator, it turns more of the equatorial drift of water into the North Atlantic than into the South Atlantic, as Figure 38 shows. The greater part of this northward-moving drift circles to the right, outside the West Indies (Fig. 39), and crosses the ocean toward Spain. A large portion of it then returns to the trade-wind belt, completing the eddy.

A small part of the equatorial drift passes into the Caribbean Sea and the Gulf of Mexico, and there is heated still further. Escaping between Florida and Cuba, this current is increased in velocity as it is forced through

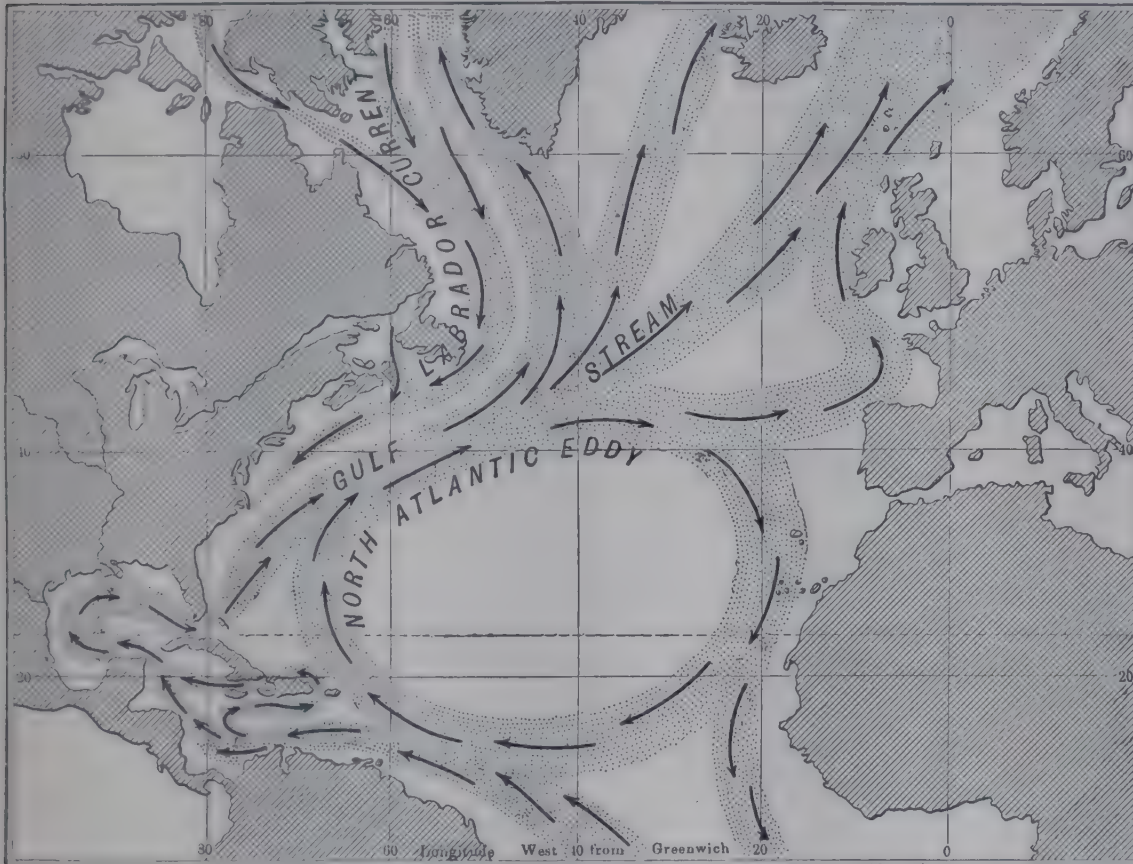


FIG. 39.

A diagram to show the currents of the North Atlantic. In order to illustrate the currents clearly it has seemed necessary to make them as if they were sharply bounded, like a river in its channel. As a matter of fact, however, the boundaries of these great currents and drifts are so indefinite that, in crossing them, one would not be able to detect the boundaries even by using the greatest care.

that narrow strait. Its speed increases to four or five miles per hour, and it therefore well deserves the name of *Gulf Stream*.

Turning toward the right, the Gulf Stream reaches the belt of prevailing westerly winds, where its waters are

driven onward to the northern coast of Europe. This drift is joined by water, driven by the west winds, from the great North Atlantic Eddy, and thus vast quantities of warm water are moved into the northeastern Atlantic and even into the Arctic to the north of Europe.

Westerly winds, warmed in passing over this drift, have made possible the great civilized nations of northern Europe, the fatherland of so many Americans. What a striking contrast these nations present to the scattered savages of dreary Labrador and Kamchatka, in the same latitude, whose winds come either from the land or from over cold currents. Notice how far northward the isotherms of the northeastern Atlantic curve in January (Fig. 36), when the strong westerly winds of that season bear warm waters onward into the cold northern ocean. Owing to this warmth Russia is able to have a harbor on the very shores of the Arctic.

Much of the water which enters the Arctic from the south returns in the Labrador Current (Fig. 39), a cold current which flows between the Gulf Stream and the shores of Labrador and New England. It is partly the easterly cyclonic winds from over this cold current that make Labrador so bleak, and the New England coast so agreeable in summer and so damp and chilly in winter.

The isotherms of the North Atlantic are close together as they leave America, but spread apart like a fan toward the Old World (Figs. 36 and 37). The cause is evident. On the American side the currents approach each other, one from the north bearing Arctic cold, the other from the warm south. This causes great temperature contrasts between our northern and southern coasts. On the European side one part of the ocean drift passes northward, raising the temperature and bending the isotherms far northward. The remainder turns southward and, being somewhat cooler than the region into

which it enters, slightly lowers the temperature and bends the isotherms southward. Thus the isotherms are spread apart.

When the first settlers came from England they expected to find in the New World a climate like their own in the same latitude. They were unprepared for the severe winters which they actually found, and thus the first settlements on the New England and Canadian coasts were failures.

REVIEW QUESTIONS — (1) What factors determine the temperature of a country? (2) What is an isotherm? (3) How do highlands affect the isotherms? (4) Give examples showing how isotherms are affected by distance from the ocean. (5) By prevailing winds. (6) State the cause of ocean currents. (7) Locate the five vast eddies of ocean waters. (8) Tell about the Japan Current and its effects. (9) Tell about other currents in the North Pacific and their effects. (10) Tell about the eddies in the southern oceans, and their influence on the isotherms. (11) Describe the North Atlantic Eddy and the Gulf Stream. (12) How do they influence the isotherms? (13) In what respects are the Gulf Stream and the West Wind Drift particularly important? (14) Locate the Labrador Current and state its influences. (15) How are ocean currents of great service in both frigid and torrid zones?

SUGGESTIONS — (1) Does the presence of a warm or cold current near a certain country necessarily greatly affect the climate of that country? (2) Locate the cold ocean currents of the world. The warm currents. (3) What is the effect of warm currents upon the building of coral islands? (4) Tell about the icebergs in the Labrador Current. (5) Estimate the length of the circumference of the great eddy in the North Pacific. (6) Name several points in the world that have about the same average temperature in January as Chicago. (7) Which of these would have about the same range of temperature, — or difference between summer and winter, — that Chicago has? (8) What is meant by the heat equator? Where is it in July? (Figs. 31 and 32.) In January? Where farthest from the geographic equator? Why? (9) Follow one of the isotherms on the map and explain the larger irregularities.

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VI. PLANTS AND ANIMALS

Zones of Life. — As there are three zones of climate, — tropical, temperate, and frigid, — so there are three great divisions of life; for both plants and animals vary with temperature and rainfall. State some reasons why this must be true and give illustrations. But since there are differences of climate within each of the great zones, there must also be differences in the plant and animal life. We shall now study about some of the great life zones.

Tropical Forest Belt. — The tropical zone is a region of continual warmth and, in many portions, of abundant rainfall. Name some of the sections in this belt that have heavy rainfall. In this hot climate the vegetation retains its leaves and grows throughout the year. Owing to this fact and to the abundant moisture, the foliage is very heavy (Fig. 40) and the ground is densely shaded. Among the trees there are many of great value either for their wood, their sap, or their fruits. Mention some of them. Name some valuable food plants that grow only in tropical regions.

The dense foliage of the forests greatly hinders evaporation, and renders the atmosphere so damp that many plants thrive with their roots in the air instead of in the soil. Aside from trees, therefore, there are vines and hanging plants without number (Fig. 86), some of the most beautiful kinds being the orchids which abound. The forest tangle thus produced is almost impenetrable.

The labor required to clear land producing such vegetation—and to keep it clear for farming—is far greater than in the temperate forest regions of the United States. This difficulty is increased, too, by the extreme heat and



FIG. 40.

A view in the tropical forest of South America, showing the dense tangle of vegetation.

by the unhealthfulness resulting from dampness. For these reasons, in spite of the great fertility of the soil, the zone of dense tropical forests is almost everywhere sparsely inhabited; and in nearly every case its inhabit-

ants are savages. They have become accustomed to the climate, and, owing to the ever present supply of food which the surrounding trees and bushes afford, they find little work necessary. Is that good fortune for them? On the other hand, there is an enormous variety of animals in this forest belt. Can you give reasons why?

Among the animals insects are especially abundant. Some, like the beautiful butterflies, thrive because of the abundance and variety of tropical flowers; others, like many species of ants, live in the decaying wood; and still others have their homes in the ground. Some are harmless; but many, like the ants, which swarm in great numbers, are very troublesome.

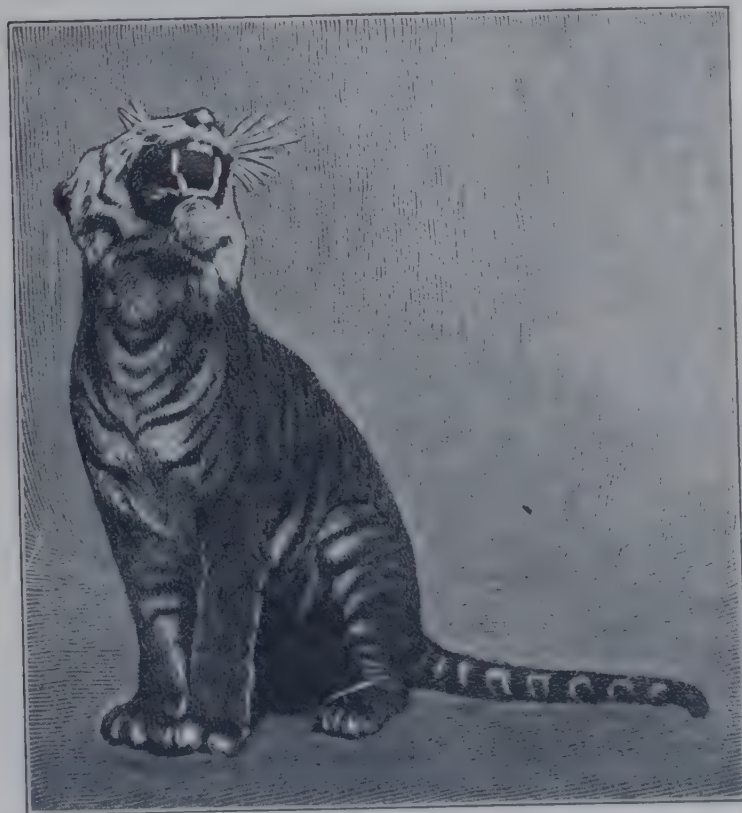


FIG. 41.

The tiger of India.

Where there is much fruit and insect life for food, birds abound; and the variety and beauty of the humming-birds, parrots, paroquets, birds of

paradise, and other species of bird life in the tropical forest, are far famed.

Among the mammals there is less variety and abundance, the greatest number, as the monkeys and sloths (Fig. 81), being tree-dwellers. Others, like the tapir, live in the swampy undergrowth; and some very large animals, like the rhinoc-

ros and elephant (Fig. 52), still live in the dense forest, where it is difficult to hunt them. Occasionally, too, fierce animals, such as the tiger (Fig. 41), in the Old World, and the jaguar, in the New, lurk in the densely growing vegetation, ready to pounce upon the more defenceless, plant-eating animals.

Reptiles also thrive in the warmth and dampness of the forest. Great snakes twine themselves like huge vines among the trees and underbrush, and poisonous serpents are common. The standing bodies of water encourage water life,—for example, the turtle and alligator among reptiles, and the hippopotamus and manatee among mammals.

It is, first of all, the dampness and warmth that lead to so much animal life. But another fact should also be kept in mind; namely, that there is a great abundance of plants upon which the animals can feed. Even those, like the jaguar, that live upon other animals, are finally dependent upon plants; for the animals upon which they feed are, in most cases, plant eaters.

Savannas.—On either side of the tropical forest is a belt where the temperature is always high, but where the rainfall varies with the season, being rainy when the belt of calms migrates to it, and dry in the opposite season when swept by the trade winds (p. 34). This belt of alternate dry and moist conditions is best developed in the interior of continents, and is rarely found on east-facing coasts. Why not?

Owing to the absence of rain during one season, dense forests are impossible; but some plants, such as grasses, thrive. These are therefore grass-covered lands and are known as *savannas* (Fig. 42).

The *downs* of northern Australia, the *park lands* lying both north and south of the equator in Africa, the *campos* of Brazil, and the *llanos* of Venezuela and Colombia, are all

examples of savannas. They are dry and barren in one season, fresh and green in the other. Trees, such as palms, line the streams; but elsewhere the land is open. Grass-eating animals roam about; for example, in Africa the antelope, gazelle, zebra, giraffe, buffalo, elephant, and rhinoceros. In addition there are some flesh-eating animals, such as the lion (Fig. 43).



FIG. 42.

Negro huts on the savanna along the Upper Nile.

While tropical forests are unsuited to the life of any persons but indolent savages, the open savannas invite human inhabitants in spite of the heat. They also *compel* industry, because provision must be made for the period of drought. Therefore those African negroes who inhabit the grass lands keep flocks and carry on rude forms of agriculture. Where settled by white men, these savannas are to-day mainly grazing lands; but they are no doubt destined to become the seat of important

agriculture, for they are adapted to the cultivation of many subtropical plants.

The Desert. - - While the savannas grade into tropical forests on the side next to the equator, they are gradually replaced by deserts on the other side. Locate these deserts in Australia south of the equator, in Asia north of the

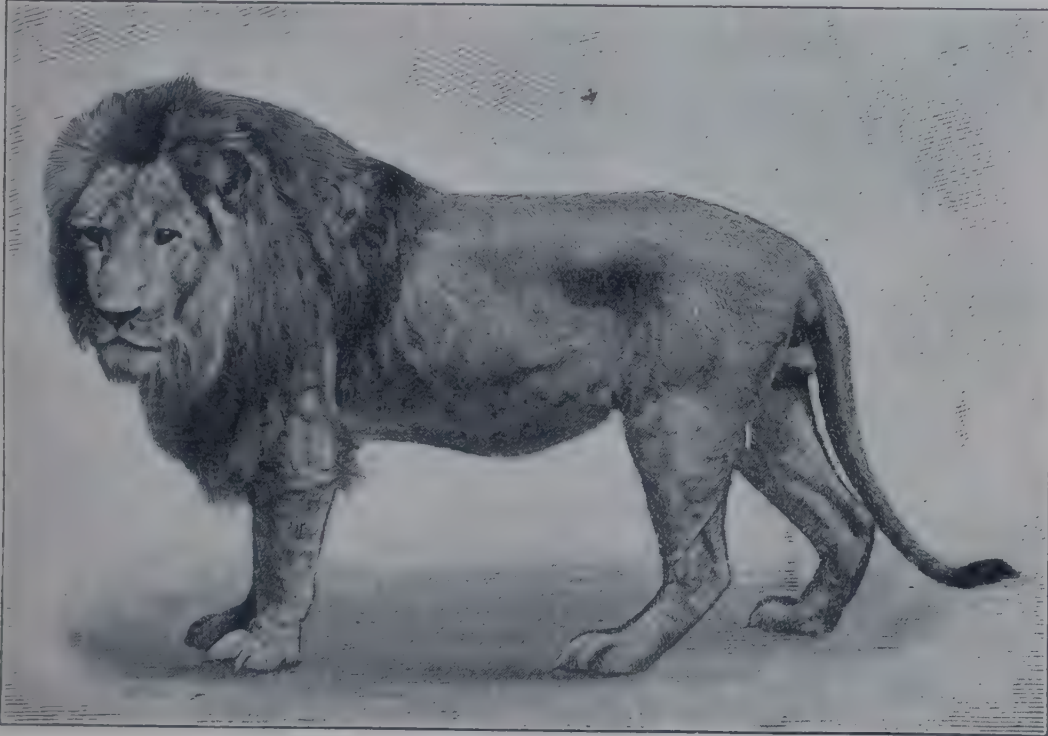


FIG. 43.
The African lion.

equator, and in Africa and America on both sides of the equator (Figs. 26-30). Explain their aridity.

In the desert there are vast stretches in which the sand is moved before the wind and piled into sand hills or *dunes*. There are also tracts glistening with salt where the water of interior basins has evaporated and left salt upon the surface. Parts of the desert are broad plains; but there are also stony plateaus, deep valleys, and mountain ranges

Throughout much of the desert there is such a lack of rain that the surface is barren and desolate at all times.

But even there, plants and animals are not entirely lacking. In some sections there are scattered clumps



FIG. 44.

The "Ship of the Desert." Why so named?

of coarse grass; and there are prickly plants, like the cacti and the acacias, in which the leaves and stems are as small as possible to prevent evaporation. In place of a dense tropical foliage there is a marked absence of leaves, and a large part of the plant is underground. This is because the roots must

struggle hard to find the necessary moisture, and the portion above ground must use as little moisture as possible and waste none; for years may pass before rain comes.

That the soil is usually fertile is proved by the fact that wherever there is fresh water, as along a stream, vegetation thrives. Such watered spots in the desert are called *oases*. The Sahara caravans halt in these garden patches, where tall date palms grow and supply a fruit of great value as a food.

One of the few animals native to the deserts of the Old World is the ostrich. Another, much used by man, is the camel (Fig. 44). The latter well illustrates how animals become adapted to their surroundings. Each foot has a broad sole which aids it in travelling by preventing the feet from

sinking into the sand. The nostrils can be closed when necessary and the eyes are protected by a veil of hair. Both of these devices are of much use in keeping out the sand which is so often blown about. The camel is further provided with pouches in which enough water may be stored to serve it two or three days; and owing to its fatty hump, which can be drawn upon for the nourishment of its body, it can also go without food longer than most other animals.

Human beings naturally shun the desert. Permanent homes can exist only on the oases (Fig. 45); but wandering tribes, or *nomads*, roam about there. They live in temporary tents, and are engaged in herding, or in driving caravans of camels laden with articles of trade. Sometimes they even raid the caravans of others for the booty they may obtain.



FIG. 45.

Loading a camel on an oasis in Algeria.

Life in Temperate Zones. — The land of temperate zones is typically forest covered. This is not due to abundance of rainfall so much as to moderate evaporation in the cool climate, which permits the ground to remain moist throughout the summer. Thus a broad forest belt crosses the northern interiors of both North America and Europe. Owing to the less extensive rainfall in some parts, and to the rigor of the climate in others, the forest is more open than in the tropics.

Steppes and Arid Plains. — There are also treeless, grass-covered lands in the temperate belt, usually on the border of the deserts in the interior of continents where the rainfall is light. In the Old World, where these tracts are called *steppes*, there is a broad strip extending from southeastern Europe to central Asia. The *Great Plains* of



FIG. 46.

A group of Persian nomads with their summer tents.

western North America, and the treeless plains, or *pampas*, of Argentina are also steppes (Fig. 91).

Spring rains cause the grass to be green in spring and early summer; but drought then changes it to gray and yellow. There are no trees excepting along the streams; and only on the very border of the steppes is there rainfall enough for agriculture without irrigation. The wild animals are grass eaters (*herbivora*), and the steppes

formerly supported great herds of deer, antelope, and bison ; but cattle, sheep, horses, and camels have largely replaced them. The inhabitants of the steppes in the Old World have for many centuries led a pastoral life and have become nomads. They wander about and live in tents during the summer (Fig. 46) ; but in winter they select more permanent homes for the sake of protection against the weather. They depend upon the horse to such an extent that it has become almost a part of their life.

Prairies. — Besides the vast tracts of arid steppes, there are some treeless plains even in parts of the temperate zone where the rainfall is heavy enough for tree growth. Examples of these are the *prairies* in the United States and some of the plains in southern Russia. Some think that fires have removed the forests ; others that the fine-grained soil has prevented tree growth ; but probably each cause has aided.

Forests of the Temperate Zone. — Near the torrid zone the trees are for the most part tropical in kind. In the cooler temperate latitudes, however, they are principally of two sorts : (1) the *evergreens*, including the pine, spruce, and hemlock, that have needle-like leaves which remain green throughout the winter, and (2) the *deciduous* trees, whose leaves are much larger, but fall when frost comes.

The value of the forests to man is great, for the coldness of the climate in the densely inhabited temperate zone demands that men shall build permanent houses for their protection. To what other uses is the wood put ? On the other hand, the forests have interfered with man's development, for the trees must be cut away before agriculture is possible. In Europe, however, a large part of the forest has been removed, and much has also been cleared away in the United States. What about Canada ?

The temperate forest was the home of many wild animals, now mostly exterminated, or greatly reduced in number. Name some of those of North America. Owing to the coldness of the northern sections these animals are protected by fur, which men find of such use that the hunting of fur-bearing animals is one of their occupations in the forest.

People of the Temperate Zone.—In the temperate zone of North and South America, Europe, Asia, and Australia, both the cleared forest lands and the humid, grass-covered plains have become the seats of extensive agricultural industries. In



FIG. 47.

A field of grain in Russia with the forest in the background—a familiar scene in the cool temperate belt. Have you seen a view resembling this?

fact, the temperate zones are the agricultural zones of the world, and they might almost be called the *zones of grain* (Fig. 47). Make a list of the grains that are cultivated; also of the fruits.

In this temperate belt, too, man has developed most highly. The simple life of the savage in the tropical forest, and of the nomad on the desert and steppes, contrasts strikingly with the varied life of the agricultural people in the temperate belt. Not only are the latter more highly civilized, but they have so increased in numbers that the temperate zone is the most densely populated belt in the world. Suggest some reasons for this.

Life in the Frigid Zone. — As one passes to the colder margin of the north temperate zone the trees become stunted and the conditions grow less favorable to agriculture. Beyond this, stretch vast expanses of frozen ground known as the *tundras*. These are covered with snow in



FIG. 48.

A camp on the edge of the tundra of northern Asia. What do you see in this picture?

winter; but in summer, when the snow melts, they are in most places exposed to the air.

During summer the frost leaves the ground to a depth of two or three feet, although below that depth the earth remains frozen for scores of feet. The continual thawing at this season keeps the soil so moist that the tundras are everywhere swampy, even on the hillsides. Then everything grows rapidly; the green grass springs up and bright flowers dot the turf. No large bushes or trees are to be seen, for all plants remain as close to the ground as possible. Why should they?

These regions are often compared with the tropical deserts in their absence of animal life; and the reindeer is compared to the camel because it permits a few persons to eke out an existence in the frozen desert (Fig. 48). But there are differences; the tundra is a desert because the cold prohibits most forms of life during the greater part of the year, while the tropical desert is *always* forbidding. Why? During the short summer, when the tundra blossoms into life, swarms of insects, especially mosquitoes, infest the morasses; and the berries of the previous season, uncovered from the snows, supply food to land birds. Why should these birds, together with the foxes and polar bears, be protected with *thick white* coats?

While life in most forms is scarce on the tundras, along the seacoast it exists in abundance. Vast numbers of birds feed upon the minute sea animals in summer, and migrate southward in winter when ice covers the sea and cuts off their food supply. The walrus, whale, narwhal, and seal sport in the water, the latter in such numbers as to supply the chief food for the scattered colonies of Eskimos and other people who live along the coast.

Oceanic Life. — There is little variety in the plant life of the sea. Animal life, on the other hand, is extremely varied and abundant. Countless millions of minute creatures, floating in the surface waters, serve as food for larger species, such as the whale and the food fishes. Some of the food fishes, as the mackerel and menhaden, swim at the surface in multitudes, called *schools*. Others, as the halibut and cod, live on the bottom, especially on those shallow banks that are swept by the food-bringing currents.

Animals inhabit all parts of the ocean, even the deep sea and the surface water far from land. But the chief fishing grounds are the seacoast itself and those shallow banks near the coast that can be easily reached. Besides the various species of food fish, there are shellfish, such as clams and oys-

ters; and crustaceans, such as crabs and lobsters. Among the important lower forms unsuited for food are the sponges, and the tiny corals out of whose limy skeletons many islands in the ocean have been built.

Some of the higher ocean animals once lived entirely on land, and have slowly adapted themselves to the ocean. The polar bear, for instance, lives partly on the ice-covered sea; and many birds, as the penguins and ducks, spend part of their time in the water. The seals, related to the bears, still crawl upon the shore at times, though their natural home is now the water; but the whale never leaves the water, though he must still have air to breathe.

Causes for Distribution of Plants and

Animals. — In what has been said about the tropical forests, the camel, seal, and whale, there lies the suggestion that the different sections of the earth

were not supplied with certain forms of life at the beginning which they were to preserve throughout

all ages. On the contrary, it seems that plants and animals, like man himself, have been forced to adapt themselves to the conditions which surrounded them.

This is now generally believed to be the truth. Plants and animals, like the earth itself, have been constantly changing; and the wonderful ways in which they are now

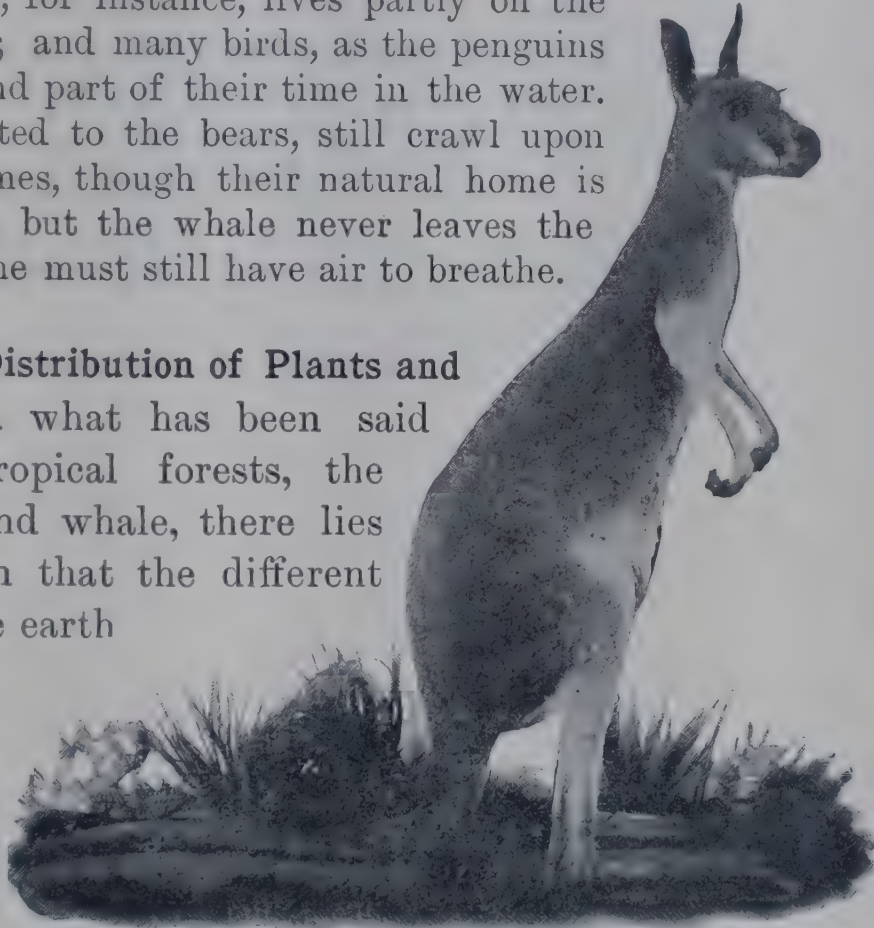


FIG. 49.

The kangaroo of Australia.

adapted to their surroundings is the result of ages of struggle in which tens of thousands of species have been destroyed because they could not fit themselves to the changing conditions. This conclusion finds support from a study of life upon oceanic islands.

Many islands far from land support *some* of the plants and animals that exist upon the nearest continents. For instance, the Bermudas have forms of life similar to those of North America. But many of the species living on the mainland, particularly those kinds that could not endure a long journey, are absent from such islands.

Birds, bats, and insects, being able to fly, naturally find their way to the islands. Some reptiles are also found, since, without food or water, they are able to float long distances clinging to logs. But large and highly developed mammals, like the elephant, tiger, or deer, are almost always absent from oceanic islands.

Australia is really a great oceanic island; but it has many large animals which differ from those found on the other continents. There are kangaroos (Fig. 49), some varieties of which are large, others small like rats, but all of which leap clumsily about on two legs, aided by the large, muscular tail. And there is the duck-billed platypus, which, though a mammal, lays eggs as birds and reptiles do. The peculiarity of these Australian mammals is that their young are not nearly so developed as are the young of the higher mammals. Other Australian mammals, birds, and even plants are also peculiar.

Fossils in the rocks prove that, long ago, animals similar to those of Australia lived on the other continents. It is believed that mammals reached Australia in those

ancient times when that continent was still connected with other lands. Then came a sinking of a part of the earth's crust, separating Australia from the other continents, where fierce animals later developed which were unable to cross the sea to Australia.



FIG. 50.

Therefore the weak mammals were able to survive in Australia while the same kind elsewhere were destroyed.

The llama of Peru, a South American animal not found in North America.



FIG. 51.

Buffalo cow and camel in the Nile. These animals are common to Africa and southern Asia.

North and South America have some animals in common, such as the puma, jaguar, and tapir; but on the

whole there is a marked difference between the faunas of the two continents (Fig. 50). One reason for this difference is that in past ages South America was entirely cut off from the northern continent.

Africa has much the same climate as South America; but, being so widely separated by ocean water, the faunas of these two continents are entirely different. On the other hand, many of the animals of southern Asia, such as the lion and elephant (Fig. 52), are similar to those of Africa (Fig. 51), since the two land areas are so close together.



FIG. 52.

The elephant, an animal common to southern Asia and Africa.

The north temperate zone, including much of North America and Eurasia, has closely related species of plant and animal life. Throughout this vast area there are pines, spruces, hemlocks, oaks, maples, etc., on the one hand, and bears, wild cats, wolves, deer, foxes, beavers, etc., on the other. The reindeer of Europe and Asia (Fig. 48) is almost identical with the caribou of America; and there is also a close resemblance among the birds. This similarity is partly due to similarity in climate, and partly, perhaps, to a former connection of the two lands. There is, however, little resemblance between the life of this belt and that of central Africa and southern Asia; for the vast desert belt and the lofty mountains have served as barriers to the spread of plants and animals.

Thus it is seen that the life on each continent has varied from time to time, and that both plants and animals have spread wherever conditions allowed. The greatest barrier to a general distribution has been the ocean; but deserts and mountains have also offered effective resistance. State why.

Changes throughout the ages, causing variations in climate, in the land surface, in the food supply, and in the introduction of new enemies, have brought death to many species. This may be illustrated by those extinct relatives of the elephant, the huge mammoths and mastodons, that formerly lived in the cold temperate zone. It is also illustrated by many birds. In former times running birds (Fig. 53), like the ostrich, were abundant; but they are now giving place to small flying birds, that are better adapted to their environment.

Man is at present one of the most effective agents in producing changes in the plant and animal world. He is constantly developing new varieties of each,

while destroying older forms. He has improved and domesticated many wild animals, but has exterminated some, like the auk, and nearly destroyed others, like the bison. The changes he has caused in the vegetable kingdom are to be seen on every hand. Can you mention some of them?

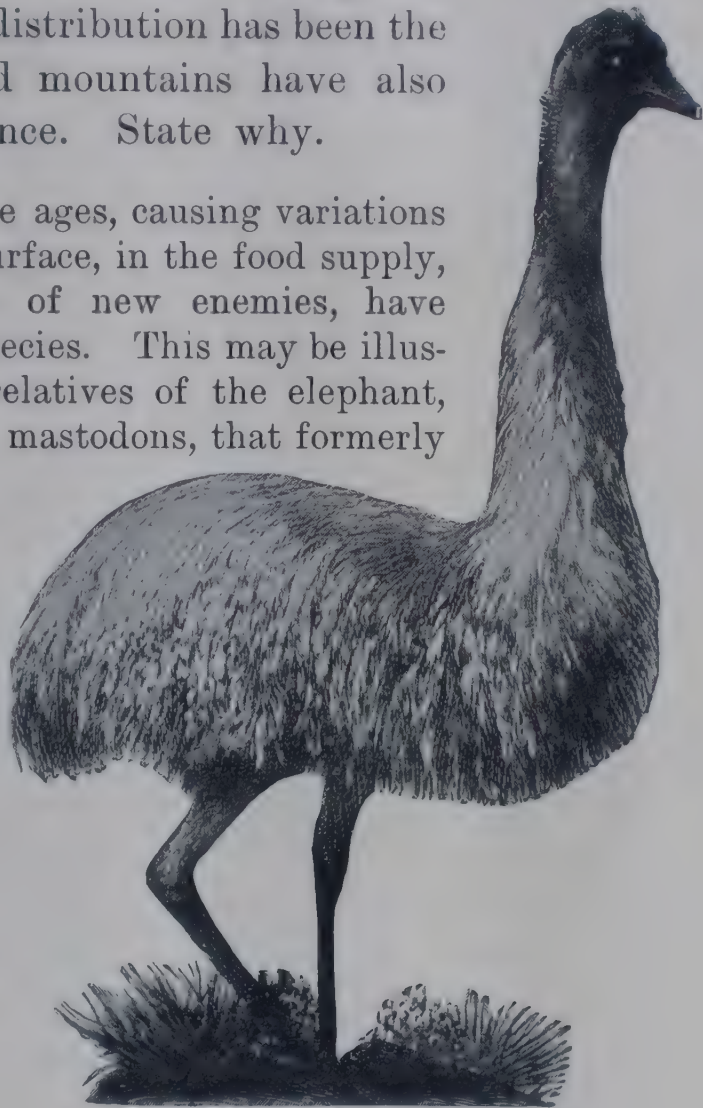


FIG. 53.

The emu of Australia, one of the running birds.

REVIEW QUESTIONS. — (1) By what factors are life zones determined? (2) Describe the conditions of plant life in the tropical forest. (3) What effect have these conditions upon human beings? (4) Upon animals? (5) What is the origin of savannas? (6) Locate some of them. (7) What about plants, animals, and people there? (8) Tell about the desert: cause, characteristics, plants, oases, animals, and people. (9) Tell about the conditions of life on the steppes and arid plains. (10) What is known about the cause of prairies? (11) Tell about the temperate forests: trees, animals, and human inhabitants. (12) Tell about life in the frigid zone. (13) Tell about the tundras: vegetation, similarity to the desert, animal life, and human inhabitants. (14) Tell about ocean life: plants, food fishes, other important animals and land animals that have learned to live in the sea. (15) What about the adaptation of animals to their surroundings? (16) What light is thrown upon this question by the life on ocean islands? (17) Give some facts about Australian animals and the reasons for their peculiarity. (18) Tell about the animals on each of the other continents. (19) What are the great barriers to the spread of life? (20) Name some causes for extermination of species.

SUGGESTIONS. — (1) Make a collection of different kinds of wood. (2) Notice how some of them are polished for use as furniture. (3) See some orchids, if possible. (4) Visit a museum to see specimens of tropical animals. (5) Examine a cactus closely. (6) Examine and compare the foliage of some evergreens and deciduous trees. (7) Find out what is meant by *evolution* and the *survival of the fittest*, as these terms are applied to plants and animals. (8) What dangerous enemies have you observed for certain plants? (9) For certain animals? (10) Collect pictures of animals belonging to different parts of the world.

VII. THE HUMAN RACE

DIVISIONS OF MANKIND



Man, like plants and animals, varies in different parts of the world. He is influenced by his surroundings, as they are, and in the course of time has developed differently in the various lands of the earth. Concerning the *origin* of the human race, and its divisions, people hold different views; but mankind in general may be divided into four great groups.

Ethiopians. — Altogether there are about one and one-half billion human beings upon the earth, or twenty times the number in the United States. Of these the lowest are the negroes (Figs. 54



FIG. 54.

An African negro girl.

and 62) or *Ethiopians*, who number about one hundred and seventy-five million. This is often called the *black race*. There are many subdivisions of this group, but they are all characterized by a deep brown or black skin, short, black, woolly hair, broad flat noses, and prominent cheek bones.

The home of the Ethiopians is Africa south of the Sahara desert (Fig. 60), though many have been transported to other lands as slaves, and have there mingled more or less with the other races. In their original home the negroes are savages, or barbarians of low type.

The native Australians (Fig. 55), the Papuans of New Guinea, the Negritos of the Philippines, and the blacks on

some other islands in that part of the world resemble the negroes most closely, though differing from them in some important respects. They are shorter, for example, their hair is less woolly, their noses straighter, and their lips less thick.

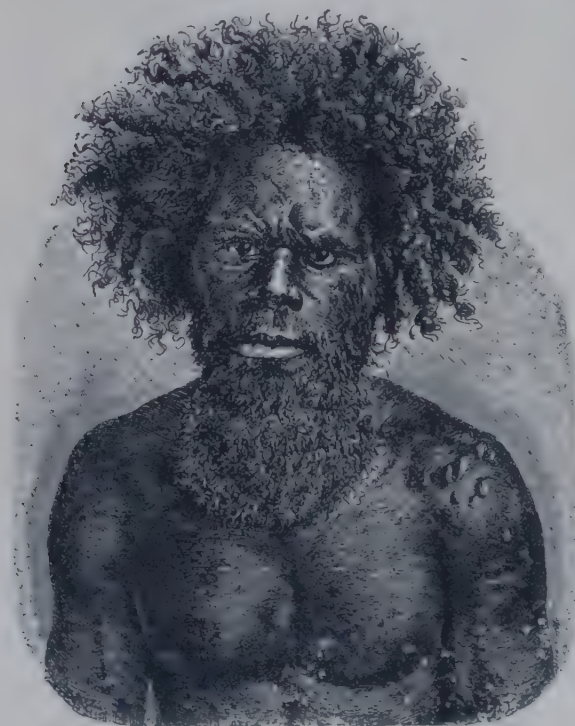


FIG. 55.

A native of New South Wales, Australia.

American Indians. — A second great division of the human race is that of the *red men* or *American Indians*, often called the *red race*. It is the smallest of the four

groups, numbering about twenty-two million. These people, who in some respects resemble the Mongolians (p. 73), were in possession of both North and South America when Columbus discovered America. They were, however, divided into many tribes. While the Indians have been largely displaced by white men, many, especially in the tropics (Figs. 56, 61, and pp. 107–109), are still living in the savage state.

They are distinguished by a copper-colored skin, prominent cheek bones, black eyes, and long, coarse black hair. When discovered many were savages, while others had risen to the stage of barbarism. In fact, the Aztecs of North America and the Incas of South America had even developed some of the arts of civilization (p. 109).



FIG. 56.

South American Indians.

Mongolians. — The third division, the *Mongolian* or *yellow race*, numbering about five hundred and forty million, are typically Asiatic people, the greater number being found in Asia and the islands of the Pacific (Fig. 60). Some, as the Finns, Lapps, and Turks, have settled in Europe, while the Eskimos have spread eastward along the shores of Arctic America.

The Mongolians, typically represented by the Chinese and Japanese (Figs. 57 and 68), have a yellowish and in some cases even a white skin, prominent cheek bones, small oblique eyes, a small nose, and long, coarse black hair. In places, as on the more remote islands, the Mongolians are uncivilized; but the great majority may be classed as

civilized people, although their standard of civilization differs from that of the white race.

Caucasians. — By far the largest and most civilized of the four divisions of mankind is the *white* or *Caucasian*



FIG. 57.

Japanese ladies.

race, which numbers about seven hundred and seventy million. Their original home is not known. Some believe it to have been in the plateau of central Asia, others in the northern part of Africa. With the dawn of history the white peoples of Europe were mostly barbarians ;

but civilization had begun to develop in southern and western Asia and along the shores of the Mediterranean Sea.

At present the white race occupies most of Europe, North and South America, Australia, and large portions of Asia and Africa. It is the most widely distributed of the four divisions (Fig. 60). Besides Europeans (Fig. 58) it includes the Egyptians, Arabs, and Abyssinians of Africa; also the Arabs, Persians, Armenians, Afghans, and Hindus of Asia (Fig. 59).

While for various reasons the Caucasians differ greatly in characteristics, two main branches are recognized: (1) the fair type (Fig. 58), with florid complexion,



FIG. 58.

A-Belgian peasant girl.

ion, light brown, flaxen, or red hair, blue or gray eyes, and height above the average; (2) the dark type (Fig. 59), with fair skin, dark brown and black hair, often wavy or curly, and black eyes. In temperament both are active, enterprising, and imaginative, though the fair type is more solid, the dark type more emotional.

Distribution of Races. — For centuries these four great divisions of the human race have been changing within themselves until there are now many subdivisions of

each group. By war and invasion they have encroached upon one another, and have intermixed to some extent. But the leaders are the whites, who, having learned the use of ships in exploring distant lands, have spread with



FIG. 59.

.A group of Indian Brahmins, who belong to the dark type of Caucasians.

a rapidity never seen before. Also, being more advanced than the others, the white races have readily conquered the weaker people and taken their lands from them. They now dominate the world (see Fig. 60), the only division that has held out against them being the Mongolians, whose very numbers have in large measure served to protect them.



FIG. 60.

Make a sketch map similar to this to show the general distribution of the four races of man.

DEVELOPMENT OF CIVILIZATION

The facts of history indicate that the civilized races of the world have developed from a state of savagery or barbarism. It is further believed that certain races have not developed because of unfavorable surroundings.



FIG. 61.

An Indian hunter in the Amazon forest.

These are called *natural races* because they still depend directly upon nature for their food, clothing, and shelter, while the more civilized races have to a certain extent risen above such dependence. Therefore, by studying the natural races we may gain some hints concerning the development of civilization.

Need of Food.—The most essential need of man is food; and human beings in general are so constituted that they will obtain their food in the easiest possible manner. If it grows upon trees near by, or can be obtained by simple hunting devices (Figs. 56 and 61), man is apt to do no more work than is necessary to secure food that is near at hand. His life is simple, his needs are few, and his advance is slight. It is in the

tropics that these conditions exist, and it is there that we find the least civilization

Where these conditions are found only a small number can live, because there is a limit to the food that is easily available; therefore the tropical forest zone is for the most part sparsely inhabited. In fact, it is said that parts of the tropical forest average but one person for every twenty-four square miles; and most of the inhabitants dwell near the rivers. Can you suggest reasons for living there? When the numbers increase greatly, new means of obtaining food must be found; and for this purpose war and even cannibalism are sometimes resorted to.

Development of Agriculture. — But by far the most common means of adding to the supply of food is through the care of plants and animals. The plant world offers valuable foods stored in seeds, bulbs, and roots. Under natural conditions these foods are scattered, and agriculture

doubtless began by gathering them from the wild plants, as many native tribes still do. A step in advance would be made by *planting* such seeds near the home and keeping out the weeds (Fig. 62).

Moreover, in some climates it is *necessary to store* a supply against a season of need. For example, the winter of the temperate zones and the dry season of the savannas must be provided for. This encourages industry, thrift,



FIG. 62.

An African negro woman planting.

the building of permanent homes, and inventions for saving labor. Thus agriculture is one of the great civilizers.

Agriculture probably began upon the open lands; and among natural races it is for the most part still confined there. Later small patches were cleared in the forest; but this was difficult, especially in tropical countries, where the fight against weeds is a hard one. It is so hard, in fact, that there is little development of agriculture in such woodlands. The temperate forest also offers difficulties, but fewer than that of the tropics, and consequently much of it has been cleared. The frigid zone and the true desert permit no agriculture; but where irrigation is possible the latter may be made to yield a harvest. Mankind early learned to cultivate the soil by aid of irrigation, and some of the seats of early civilization, as in Egypt and Persia,

were on river flood-plains, where agriculture was carried on in that way.



FIG. 63.

The buffalo in Egypt, one of the many native animals that have been domesticated by natural races.

Development of Grazing. — In spite of the fact that it has been difficult to domesticate animals, mankind has made many of them serve his needs. For example, the dog has been made to aid in hunting; the ox, horse, camel and buffalo (Fig. 63) to serve as beasts of bur-

den; the sheep, cow, goat, and others to supply materials for clothing and food. Name some of the kinds of food and clothing obtained from these animals.

While it was doubtless the needs of the farmer that

led to the domestication of many animals, it is the herders who have come to take care of them most extensively. The people who make grazing their occupation find it necessary to roam about with their herds in search of grass, and are therefore called *nomads* or wanderers. They naturally show preference for the open plains. Why?

The life of the nomad tends to make him restless, self-reliant, and warlike, while that of the farmer is peaceful. Each



FIG. 64.

One of the boats in use in Burma in southern Asia.

class is capable of development to a certain extent, although in different ways; but the best character comes from a union of the two natures. Fortunately this union has often been effected, though at cost of many human lives. Agricultural people have been much exposed to the raids of nomads, who had little to lose and much to gain by such war. In consequence most agricultural races have become mixed with nomadic people; for the latter have often conquered whole sections of agricultural country. For example, the Chinese are an agricultural race who have been influenced in this manner; and nomadic hordes from Asia made many incursions into Europe in early days.

Development of Fishing. — A third direction in which natural races have made progress is by contact with the sea. To obtain food from the sea, boats were needed (Fig. 64); and when men had come to use them with skill, they were able to explore regions beyond their horizon. The use of the boat produces men of energy, courage, and skill. Partly as a result of this, and partly because of the protection which the sea furnishes against invasion, the highest advance of races has occurred along the seacoast, especially on islands and peninsulas. Why there? It may be said, in fact, that civilization has in general spread from the coast to the interior.

Development in the Temperate Zone. — It is along the coasts of the temperate zones that the greatest progress has occurred, because, while there are difficulties to overcome, they are not great enough to discourage. The need of storing supplies for winter has led, by natural steps, to the accumulation of wealth, to trade, and to various other forms of industry. The farmer, herder, and fisherman supply food; but they in turn need implements, clothing, and other articles. At first, among natural races, each man supplies these for himself; but with further development it is found desirable to devote one's whole time to one's special occupation. Thus some obtain food, others make weapons, tools, etc.; and by the exchange which thus arises, commerce is developed, and with it a great advance is made.

Shelter. — Even the most primitive races have need of shelter from the heat, cold, or rain. To this day some live in hollow trees, like the beasts; but most have developed a higher type of shelter. A more advanced stage is reached when the limbs of low trees and bushes

are bent over and woven together for protection; or when bushes are stuck into the ground and their limbs fastened together. Beginning with these simple devices, there is every gradation to the elaborate grass huts of the negroes (Fig. 65) and the wooden houses of the whites.

Early races often lived in caves, especially where the climate was so cold that winter protection was necessary.

This was true of early Europeans and of some American Indians; it is still practised in parts of the earth. It is a step in advance to build partial houses beneath overhanging cliffs, where the roof and one wall are supplied by the solid rock, as among the cliff dwellers of western United States. Then comes the house composed entirely of stone, or of dried clay, either the sun-dried adobe or the baked brick. The highest development of architecture is reached in the massive public buildings of the present day.

Nomadic races, travelling about as they do, require portable dwellings (Fig. 46); and their most common shelter is composed of skins, which are not only light but easily obtained from their herds. In case of longer residence in one place they may build more permanent homes, either of wood, clay,



FIG. 65.

Huts in a negro village in Africa.

or stone. Also, with abundance of wool and other kinds of animal hair, these people have learned to weave blankets and rugs, which are an additional shelter when travelling.

From these facts it is seen that natural and semi-civilized races obtain shelter by the use of materials near at hand and adapted to their mode of life. This is especially well illustrated by the Eskimos, whose summer homes, when they are moving about, are made of seal and walrus skins; while their winter shelter is built of blocks of ice or snow, the most available building materials.

Sites for Houses.—The sites for these dwellings often seem to be selected with reference only to the nearness of building materials or of food. But very commonly they are determined by the necessity for protection from man or beast. The cliff dwellers of the West, for example, selected their sites with the idea of defence against wandering tribes of savage Indians; and the Pueblo Indians built their pueblos upon hills for the same reason. Civilized people, likewise, have often located their castles upon lofty cliffs.

Find illustrations in the sections on Europe. Among natural races, houses are sometimes built in the treetops



FIG. 66.

Houses in the trees in New Guinea.

(Fig. 66) for protection against enemies; and sometimes they are even built on posts or piles in the water (Fig. 67).

Towns and Cities. — The same reason that induces natural races to build their houses in positions which afford protection from enemies, has caused people to collect in villages (Fig. 65), towns, and cities. These are often



FIG. 67.

A village on piles in New Guinea.

surrounded by water (Fig. 67) or by stockades; and in the Middle Ages the cities of Europe were very effectively protected by walls of stone. Many European and Asiatic cities are still enclosed in walls, and in Asia they are even now kept in repair; but the modern cannon render such defences of little value.

While the sites of some cities have been selected for no other reason than their ease of defence, the growth of civiliza-

tion has given other reasons for people to collect in cities. For example, some have simply wanted to live together, or to be near valuable mineral deposits, or near water power, etc. Give other reasons.

Clothing. — In regard to clothing, as to shelter, there are many varied customs. Here again the natural races show most dependence upon their surroundings. Some of those in the tropical zone find very little clothing necessary (Figs. 56, 61, and 87). Others clothe themselves in bark, as some of the Germanic people of Europe did in early times. In the cold climates skins are used, as among many of our European ancestors, and at the present time among the Eskimos, Lapps, Fuegians, and some of the North



FIG. 68.

Japanese rain coats.

American Indians. What other reason than cold would lead these people to use fur-bearing skins?

From the use of such simple natural products it is but a step to crude hand manufacture; then follows manufacture by machinery, run first by hand or foot (Fig. 58), then by water power, and finally by steam and electric power. Doubtless at first such native products as the wool of animals, the fibre of wood, wild cotton, and flax were used; then plants and animals were raised for their fibre and hair. Even the insects are called upon to aid man in his attempt to clothe himself; for silk is used in many lands.

The Development of Language. — There are hundreds of different languages among the races of the earth, and no one knows their origin and history. In the very earliest times about which we know there were vast differences of speech; and even since history began to be recorded, the speech of nations has greatly changed. For example, the Greek and Italian languages of to-day are very different from the Greek and Latin of two thousand years ago.

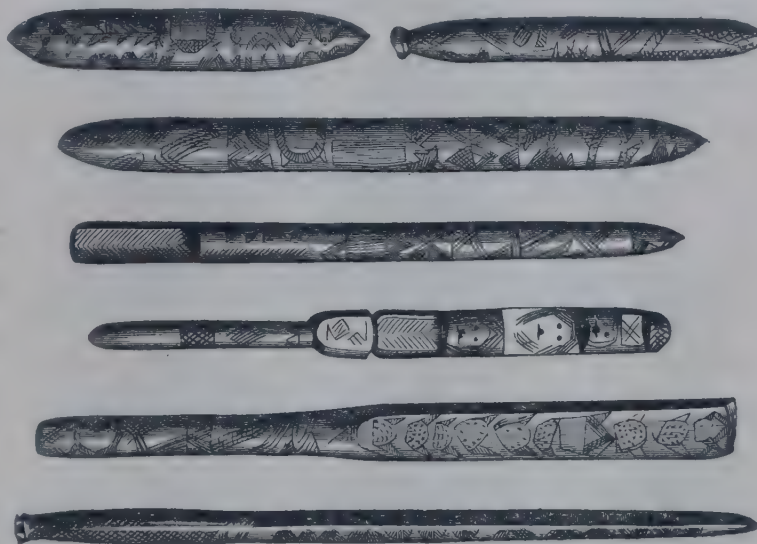


FIG. 69.

Message sticks from West Australia — the carvings convey messages.

This being the case, it is easy to see how, if time enough is granted, races separated by the sea, mountains, or desert will slowly give up old words and evolve new ones. This is thought to be the origin of the many different languages of the globe. How are these differences in language important in checking commerce and preventing sympathy of one nation for another?

Many natural races have no written language; others have a kind of picture writing (Fig. 69); that is, they represent their ideas by drawing pictures. It is from such a beginning, it is believed, that our writing and, later, our printing have developed. Writing and printing have been among the most powerful aids to civilization. Can you suggest reasons for this?

Inventions. — Even the lowest races are gifted with some ingenuity and power of invention. The savage hunters of the forest make the bow, arrow, and spear (Figs. 56 and 61). Most if not all races know the use of fire and

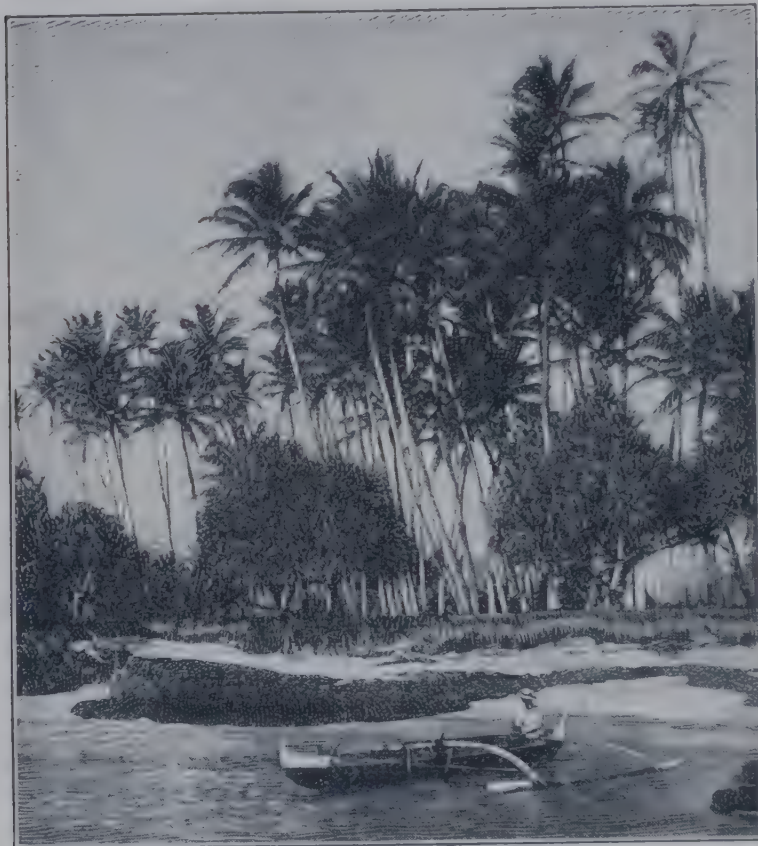


FIG. 70.

A boat with an outrigger to prevent capsizing. — Hawaiian Islands.

how to make it. Also pottery-making is common to all parts of the earth.

Farming has been responsible for many inventions — the implements for loosening the ground (Fig. 62), for planting, for reaping, for employing beasts of burden, including the harness itself, being good examples. Fishing

has also given rise to many ingenious devices, especially in the demand for boats. Some boats are of bark, as among the Indians; or of skin, as among the Eskimos, where bark is absent; or of hollowed logs, as in many parts of the world. In time the small, open boats (Fig. 70) were replaced by larger, covered vessels (Fig. 71); and finally huge ships have been made of steel. As to motive power, oars and paddles (Fig. 67) were first used, then

the wind was called into service (Fig. 71), and finally steam. Ships are one of man's most important inventions. Why? Of what service have printing, gunpowder, steam, electricity, and labor-saving machinery been in advancing civilization?

Civilized man, instead of depending upon wild plants and animals for food and clothing, has learned to cultivate the choicest of plants. He has tamed and domesticated many species of animals, too, and used them not merely as a source of food but also as an aid in his work. More than this, he has learned to control

some of the forces of nature and has caused them to do his work in an improved fashion. The result of it all is that thousands of people are able to live where only one could exist in the natural state. For example, while in some parts of the tropics there is an average of but one savage for every twenty-four square miles, there are whole countries that average several thousand civilized men on the same area.

Development of the State. — While in some tribes there is scarcely any real government, the need of a leader so frequently arises, as in the management of a boat or in war, that in most cases there is some organization. Further than that, war is so common among savage and barbarous races that it is of interest for different tribes to



FIG. 71.

A Chinese junk, a form of sailing boat long in use by the Chinese.

combine under a good leader. This forms a beginning of tribal government and of the *State*.

Sometimes, as among the Indians, the *chief* is merely a representative of the people, leading them, but not having absolute power. In other cases he is a despot to whom all subjects must yield obedience. Their property, movements, and very lives are at his mercy, his authority often being made especially secure by means of religious beliefs and rites, as among many African tribes.

In early times Europe was occupied by scattered, warring tribes governed in this loose manner. But with the development of Roman civilization on the Mediterranean, much of western Europe came under the Roman influence, and laws and customs were established which have aided greatly in the later civilization of European nations. With the decline of the Roman Empire, however, these tribes sank back in part to their old conditions. *Kings* ruled portions of the country and fought battles with neighbors, aided by leaders or *lords*, who themselves often became so powerful as to be dangerous rivals to the kings. These lords lived in well-protected castles, surrounded by farms which were worked by the common people, or *peasants*, who were little better than slaves. They were called *vassals*, and were required to serve their lords and to fight for them.

Under such conditions little advance was possible ; for while a few persons possessed much power, the masses were kept in poverty and ignorance. Little by little, however, the people have made progress toward freedom ; and to-day they are in the main emancipated, although in their kings and lords most countries of Europe still preserve **relics of the old system.**

Among the causes which have aided in the elevation of the people, perhaps none were of more importance than the discovery and exploration of new lands. Explain how that is true. The masses reached the point where they demanded the right to make their own laws; and in some countries, as in France, they even replaced the monarchy by a *republic*. In England a full measure of liberty was obtained without abolishing the monarchy, but only after many severe struggles. In America, separated from the Old World customs, and peopled by those who fled from oppression, the love of freedom was prominent from the very first; and neither hereditary king nor lord checks the masses from the full enjoyment of their liberty.

Development of Religion. — True religion is the climax of man's development; yet every race has some form of religion. Among savages it is little more than superstition. They are surrounded by nature, which they do not understand. Life and death mystify them; the tree develops from a seed, and the savages know not why; on every hand is mystery. They seek a cause, and, seeing none, are led to believe in spirits which they try to comprehend. Some they suppose to be evil, others good. Believing that these spirits have great influence over their lives, they try to win favor with them by offering sacrifices and worshipping them.

Such religion, if it may be so called, takes many forms. Some races, as the negroes, believe in witchcraft; and among them the witch doctor is sometimes more powerful than the ruler himself. If disease comes, it is ascribed to an evil spirit, and it is believed that the witch doctor can effect a cure. To ward off such evil influences charms are worn, gross rites are observed, and images or objects, called *fetishes* (Fig. 72), are

worshipped because they are believed to possess magic power. Among these objects are included fire, the sun, the earthquake, and many animals. So far as God is concerned, if these people have any conception of Him, it is of the crudest kind. The negroes, the Indians, the Eskimos, and even our own ancestors two thousand years ago had little more than this form of religion.



FIG. 72.

A fetish from
Africa.

Most races believe in a future life, though often vaguely, and as their only way of explaining the mystery of death. The Indians, for example, think that upon death the human spirit goes to a happier place, where conditions are somewhat similar to those on earth. They therefore bury hunting implements with the dead. All people with such views as the preceding are called *heathens* (Fig. 74), and are often said to have no religion. From our point of view they have no *true* religion; but they have something akin to it.

Among the semi-civilized and civilized races there are forms of belief in which the conception of God is higher, and the idea of future reward and punishment is taught. Of these religions five call for special mention.

Buddhism, followed especially in eastern Asia (Fig. 74), was established in India five or six hundred years before the time of Christ as a result of the work and teachings of Buddha (Fig. 73). But there are many differences in the religious beliefs and customs of the Asiatic people,

and in consequence there are many sects. *Brahminism* is one of the most common forms of belief, being especially followed in India. It would be difficult correctly to describe the religions of the Asiatic people in a few words; but *idolatry*, or the worship of idols, is prevalent among them. Ancestor worship is common in China; and the doctrine of caste in India,—that is, the doctrine of class distinction. Both of these doctrines, which are a part of their religion, are opposed to progress, as we shall see.



FIG. 73.

A statue, or idol, of Buddha in India.

The *Jewish* religion, still followed by many, upholds the worship of one righteous God, as taught in the Old Testament. From this, two other religions have developed, *Mohammedanism* and *Christianity*. The prophet Mohammed lived about six centuries after Christ, and the *Koran* contains his teachings. Mohammedans deny the divinity of Christ. This religion has been spread by the

sword with wonderful rapidity, especially among the semi-civilized people of Asia and Africa (Fig. 74). Many of its followers became fanatics who, believing that they thus obtained future happiness, willingly died if they could die killing a Christian.

The Christian religion, the common belief in America and most of Europe, has spread slowly, but it now num-



FIG. 74.

Diagram to show the distribution of religions. So small a map is of course only true in general — for example, it must omit many of the small sections where Christian missionaries have made converts.

bers about 440,000,000 followers. Its success, however, must not be measured by numbers alone; for Christians make up most of the really civilized people of the world (Fig. 74). It is no accident that this is so, for Christianity has been one of the chief factors in making civilization possible.

Religious belief has had much to do with inventions and the growth of industry. The Chinese, for example,

have long opposed new inventions because their ancestor worship cultivated undue reverence for past customs; also they have been unwilling to dig into the ground, for fear of disturbing the evil spirits that are supposed to dwell there. Partly for such reasons, our study of geography is chiefly concerned with Christian countries; for there we find the most varied and extensive uses of the earth in the service of man.

QUESTIONS. — (1) Tell about the Ethiopians; their characteristics and distribution. (2) Do the same for the American Indians. (3) Mongolians. (4) Caucasians. (5) Give reasons for the greater advance of the Caucasians. (6) What is believed about the early development of civilization? (7) How is food obtained by natural races? (8) Tell about the development of agriculture. (9) Of grazing. (10) What is the effect of the mixture of farming and nomadic races? (11) What influence has the development of fishing had upon civilization? (12) In what kind of regions has the greatest advance of mankind taken place? Why? (13) How do natural races secure shelter? Give examples. (14) What influences aid in the selection of sites for homes? For towns and cities? (15) What materials are employed in clothing? (16) What is known about the origin of speech and written language? (17) Give examples of early inventions. (18) What inventions have been especially important? (19) Tell about the simplest forms of government. (20) The more advanced forms. Give examples. (21) Tell about the development of religion. (22) Give some facts about Buddhism and Brahminism; Jewish religion; Mohammedanism; Christianity.

SUGGESTIONS. — (1) What members of the divisions of mankind — other than whites — have you seen in your own neighborhood? (2) What different nationalities of whites? (3) Find pictures illustrating human life in the various zones. (4) Help to make a collection of pictures for the school to illustrate the various forms of shelter and clothing. Also find such pictures in this book. (5) Find some one who has specimens of primitive implements, as Indian arrow-heads, and examine them. (6) Find out something about the ways in which savage races ornament their clothing and person.

PART II (SECTION VIII)

SOUTH AMERICA



MAP QUESTIONS (Fig. 75).—(1) In what zones does South America lie? (2) What would you expect the climate to be in the northern part? In the central part? In the southern part? (3) During what months does winter come in the extreme south? (4) What large rivers drain the continent? (5) Do you find any lakes? (6) To what extent is the coast line irregular? (7) Draw an outline map and locate upon it the mountains and rivers. Add the boundary lines of the principal countries. (8) On Figure 75 are there many islands? Where are most of them? (9) Find Cape Horn. It is south of what island? What strait separates this island from the mainland?

INTRODUCTORY SECTIONS

Physiography.—North and South America resemble each other in several respects. The former is triangular in shape and has its main highland masses on the two sides. What are their names? The western mountains are the younger and loftier, and they have many volcanic cones. They occupy a great breadth of country, the westernmost, or Coast Ranges, rising from the very shores of the Pacific. Between the extensive highlands on the two sides of the continent are low plains stretching from the Gulf of Mexico to the Arctic Ocean.

South America is likewise triangular in shape, broad at the north and tapering toward the south, and its principal highlands are on the two sides (Fig. 76). Those on the west, the *Andes* (Fig. 77), form one of the



FIG. 75.

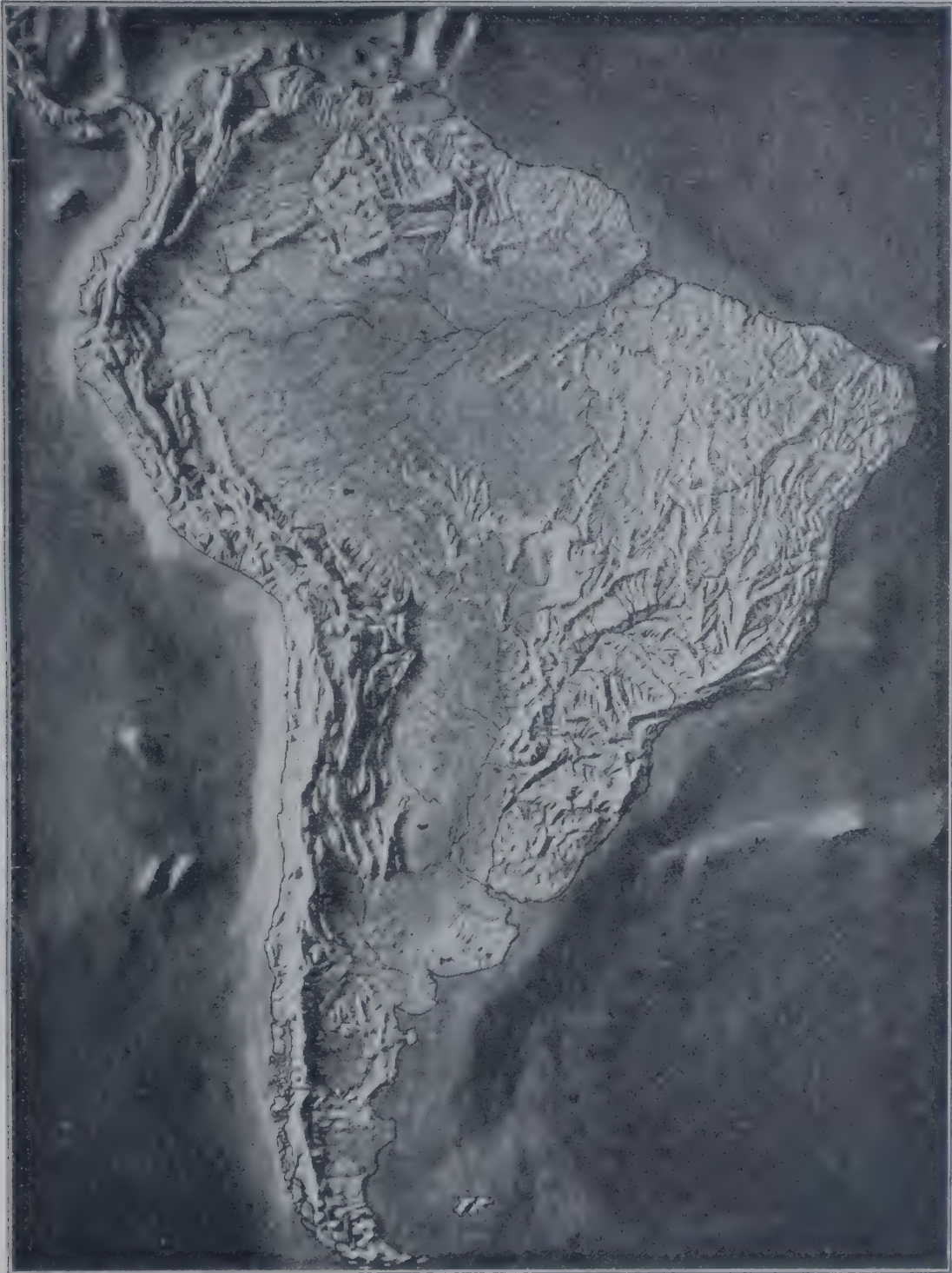


FIG. 76.

Relief map of South America. In what portion are the highlands? Which are highest? Locate the lowlands.

loftiest mountain systems in the world, and between the ranges are included deep valleys and lofty plateaus. Throughout the entire length of the continent these mountains, rising from the very seacoast, extend inland for a distance of many miles.

Many of the highest peaks of the Andes are volcanic cones. One of them, Aconcagua, in Chile, reaches an elevation of nearly



FIG. 77.

A view in one of the higher valleys of the lofty Andes.

twenty-three thousand feet, and is one of the loftiest peaks in the world. Some of the volcanoes are still active, and in a number of cases the eruptions have been terribly violent. Frequent and destructive earthquake shocks have also been experienced in this region; for the Andes are still rising, and as the rocks move they often break and cause the earth to tremble.

On the eastern side of South America the most extensive highlands are those in eastern Brazil (Fig. 76). This region, like New England, consists of ancient rocks, rising in the form of high hills and low mountains. The highest point is a little over ten thousand feet. The Guiana highland (Fig. 76), between the Amazon and Orinoco rivers, resembles the upland of Brazil and may be considered a part of it, although separated from it by the Amazon lowland. The remainder of the continent is lowland (Fig. 76) and mainly a vast plain extending from southern Argentina to the Caribbean Sea.

In South America, as in North America, the growth of mountains has raised the two sides of the continent and left a depression into which the sea once entered. But waste from the mountains, washed down by rain and rivers, has filled this depression and built the broad plains that are now there. By uplift these plains have been elevated to form dry land.

In two important respects North and South America are unlike in physiography. In the first place, their large rivers flow in different directions. Describe from memory the three or four principal river systems of North America. Make a sketch of the three largest rivers of South America. One of these is the largest in the world. Which is it? Which one most nearly corresponds to the Mississippi in position and direction of flow?

A second difference between the two continents is in regard to their coast lines. It will be remembered that much of the North American coast has been made irregular by the sinking of the land. Much of the South American coast, on the other hand, has been rising. In the former case, many fine harbors were formed; in the latter, the coast line is made straight because the level sea

bottom is being raised. Notice how very regular is most of the western coast of South America. It is the most regular coast line of long extent in the world; for a distance of three thousand miles there is a general absence of good natural harbors. What effect must this have upon the development of the continent?

Climate. -- A large portion of South America lies in the tropical zone and consequently has a hot climate. Where does the Tropic of Capricorn cross the continent? The portion south of this tropic reaches into the south temperate zone, and its climate, therefore, resembles that of the United States. What countries of South America are partly or wholly in the temperate zone? During what months do they have summer? What effect on temperature are their north winds likely to have?

Of course the mountains must cause different kinds of climate in each of these zones. For instance, in Ecuador, where the equator crosses the Andes, the temperature at the base of the mountains near sea level is high throughout the year; in other words, there is perpetual summer. Higher up the mountain sides the climate is cooler and there is perpetual spring. Still higher up, the temperature is so low that snow remains on the ground throughout the year (Fig. 77). There, in a distance of a few miles, are found dense tropical forests (Figs. 40 and 80), fields where the products of temperate latitudes are raised, and barren, frigid mountain peaks on which only the hardiest of plants can grow (Fig. 78).

The winds, together with the highlands, are the key to the rainfall. On the map (Fig. 25) it is seen that the belt of calms extends across the continent in the neighborhood of the equator. North of this belt the northeast trade winds blow (Fig. 25), while south of it is the zone of southeast trade winds. Still farther south are the



FIG. 78.

A diagram to illustrate change in vegetation with elevation. What do you see in the picture? In order to bring all this within a single view, the slope has been exaggerated and the horizontal distance shortened. It might be a hundred miles from the foreground to the base of the mountains

horse latitudes, and then come the prevailing westerlies (Fig. 25), which blow across the southern end of the continent.

We may therefore expect heavy rainfall in the vicinity of the equator (Fig. 26), where the air is constantly rising. The northern coast must also receive abundant rains (Fig. 26) because the trade winds come from the ocean and are forced to rise in passing over the slopes.



FIG. 79.

A view on the arid plateau of Bolivia — a train of alpacas is crossing here.

The highlands in eastern Brazil must likewise be well watered by the vapor-laden southeast trades (Fig. 26). Of course, these winds lose much of their moisture in travelling across the continent, but on approaching the Andes they are forced to a still greater height; accordingly, the eastern side of these ranges is wet by frequent rains (Fig. 26).

South of the belt of calms, both in the trade-wind and horse latitude belts, the western slopes and the valleys of the Andes (Fig. 26) are far too arid for agriculture with-

out irrigation. In this region large areas are veritable deserts. This arid condition is due to the influence of the mountains, which interfere with the trade winds so that the prevailing winds are from the south, and therefore parallel to the coast (Fig. 25). Since these winds are blowing *toward* the equator, and therefore becoming steadily warmer, they do not give up their moisture and form rain. Thus there are deserts on the very coast.

Farther south the influence of the prevailing westerlies is felt. In this part of the continent, therefore, it is the *western* side that receives the rain, while the eastern part is dry (Fig. 29). In rising over the land these winds cause abundant rainfall in southern Chile; but, being robbed of their vapor as they cross the mountains, they descend as dry winds upon the plains of Patagonia. With what portion of the United States may the climate of this region be compared?

From the above we see that while most of South America is well supplied with rain, two extensive areas on opposite sides of the Andes are arid. Locate them (Fig. 29).

The heavy rain in the tropical section of the continent supplies the three great rivers with an abundance of water, and encourages a rank growth of tropical vegetation. But each year, as the season changes, the belts of rainfall migrate northward and southward (Figs. 31 and 32). Therefore on each side of the equator is a belt where the rainfall varies with the season, being dry at one time of year and well watered in the opposite season. In the rainy season the rivers are flooded, and vegetation grows profusely; but with the dry season the streams shrink in size, and the plains become dry and parched. It is because of this dry period that there are open *savannas* both north and south of the equatorial forest. Trees cannot survive

the drought; but grass is able to mature its seeds during the rainy season, then die down to the ground and remain dormant until the next period of rains.

Plant Life. — In the warm, rainy belt the great humidity and high temperature are favorable to an extraordi-



FIG. 80.

Tropical vegetation in the damp lowlands of Ecuador, where there are heavy equatorial rains. The boats are dugouts, that is, logs hollowed out in boat form by the natives

nary growth of plant life (Figs. 40 and 80). So dense are the vast jungles of the Amazon that travel through them is almost impossible (p. 113); and the difficulties in the way of clearing the forest are so serious that immense areas have never been settled by other than savage Indians. In fact, much of this forest wilderness has never been explored.

In the desert of the west coast, on the other hand, plant life is very scanty (Fig. 79). There are some parts, for instance the desert of Atacama in northern Chile, where,

as in other arid sections of the world, there is almost no life of any kind.

The rainy belt and the desert illustrate the two extremes of abundance and scarcity of life. But there are other conditions in South America. For example, the *llanos* of the Orinoco valley and the *campos* of Brazil are broad tracts of treeless plains, or savannas. Why? (see p. 55). What is the cause of the treeless *pampas* of Argentina? (p. 60). With what portion of the United States may they be compared?

In those sections where the climate is cool and the rainfall moderate, as on the mountain slopes and in the south temperate zone, the land is forest covered; but the forests are much more open than the tropical jungle. The extreme southern part of the continent has a climate so cold (Fig. 108) that the plants become dwarfed, as is the case near the tree line in northern Canada.

Animal Life. — In the tropical forest there is a great variety of tree-dwelling animals, among which are many insects and beautiful birds. Among the larger animals may be mentioned the fruit-eating monkey, the fierce jaguar (Fig. 81), which preys upon other animals, and the sloth (Fig. 81), a creature which even sleeps suspended, back downward, from the branches of the trees. There are also many reptiles, including serpents and the iguana (Fig. 81), a tree lizard often several feet in length. Some of the serpents are small and poisonous; others, like the boa constrictor (Fig. 81), are large and powerful enough to crush a deer in their coils. The boa, coiled among the trees awaiting its prey, resembles a vine.

The beautiful butterflies and ants are most noticeable among the insects. Some of the ants live in the ground, others in decayed vegetation, and many of them are terrible pests. Among the most interesting insects are the termites, commonly called white ants, which live in colonies, and build houses of



FIG. 81.

Some of the animals of South America

earth. With so many insects there are naturally numerous species of insect eaters. One of the most interesting of these is the ant-eater (Fig. 81), whose long claws are adapted to digging the ants from their earthy or woody dwelling places, while its sharp-pointed snout and long tongue aid it in finding and devouring its food.

Besides these animals there is the tapir (Fig. 81), five or six feet in length, which wanders about at night, feeding along the watercourses; and the armadillo (Fig. 81), a burrowing animal protected by an armor. When attacked by an enemy, the armadillo rolls itself into a ball, enclosing its soft under parts. In the river waters and swamps are fishes, turtles, and alligators (Fig. 81). The turtle eggs and fish are among the principal foods for the forest Indians. Here also is found the manatee (Fig. 81), or sea cow, a mammal that has become adapted to life in the water. It lives both in fresh and salt water and ascends the Amazon even as far as Ecuador.

On the open plains, herds of deer roam about, and also the rhea (Fig. 81) — often called the American ostrich — one of the few large running birds (p. 69). It lives on the open plains, as in Patagonia, where are also found herds of guanaco, a kind of wild llama.

Among the crags and peaks of the Andes dwells the condor (Fig. 81), the largest of the flying birds — so large that it kills and carries off small deer. In the mountain valleys live the llama (Fig. 81) and its allies, the vicuna and alpaca, both wild and domesticated (Figs. 50, 79, and 105). Like other mountain dwellers the llama is sure-footed on the rocks, and is thus of great use as a beast of burden; and the cold climate causes it to have a thick coat of wool which is of value to man. Because of its usefulness the llama is sometimes called the American camel.

The People. — When South America was discovered by Columbus, it was inhabited solely by red men. Of these many were typical savages; and even at the present day some of the forest Indians are savages (Figs. 56 and 61),

living solely upon fish, game, and the abundant fruits. It is still unsafe for white men to go among them, and indeed

there are forest tribes which still practise cannibalism (Fig. 82).

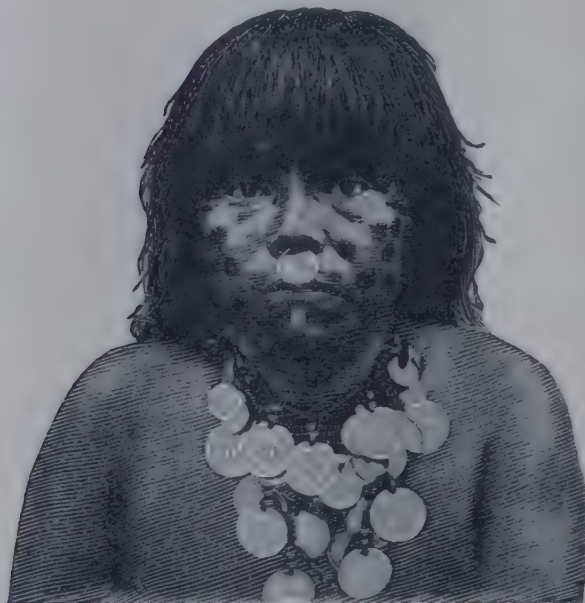


FIG. 82.

A cannibal girl from the tropical forest of Peru.

Along the coast and some of the larger rivers the red men found by the early explorers were more advanced. Like most of the North American Indians, they were in the lower stages of barbarism. In a crude way they cultivated the soil and manufactured a few simple implements. Many Indians in the more remote

districts still live in this primitive way, though large numbers have mixed with the white settlers and adopted their customs.

But among the Andes, especially in Peru, Bolivia, and Ecuador, the Spanish explorers found tribes of Indians, under control of the Incas, who had developed far beyond their neighbors. Indeed, like the Pueblo and Aztec Indians of North America, they had reached the early stages of civilization. The temperate climate of their mountain valley homes favored advance. And the protection from the inroads of their more savage neighbors, which the arid country and mountain barriers offered, gave them the opportunity to develop arts and to advance in other ways.

By the aid of irrigation the Incas tilled the soil, cultivating the potato, corn, and Peruvian cotton, all of which they had improved from wild plants. They domesticated the llama and alpaca (Figs. 50, 79, 81, and 105) for their wool (Fig. 83) and for use as beasts of burden and work animals on the farm. They had well-organized armies, built roads (Fig. 84), and had a rude postal and express system by swift runners. Although the Incas had not invented writing, they kept records by means of knotted strings. Their empire, which extended



FIG. 83.

Some of the cloth and other articles made by the Incas.

for more than two thousand miles along the Andes, and from the Pacific to the trackless forests of the Amazon, was governed by a powerful chief whose capital was Cuzco in Peru. All together the stage of advancement reached by these red men was wonderful (see also p. 137).

The Spanish, encouraged by the discovery of rich deposits of gold and silver, seized almost all of South

America excepting Brazil, which was settled by the Portuguese. They treated the aborigines with great cruelty, especially the Incas, whom they robbed of their treasures and reduced to slavery. As in North America, the Spaniards intermarried freely with the Indians, so that the present inhabitants of South America are to a large extent of mixed blood. The introduction of negro slaves has led to a still greater mixture of peoples. Therefore, while



FIG. 84.

A bridge made by the Incas.

there are still pure-blooded Indians and negroes, and also pure-blooded white men, especially Spanish and Portuguese, the greater number of the South Americans are a mixture of two or more of these very different races. This fact is one of the main reasons for the unstable governments of some of the South American countries.

Spain maintained her control in South America for fully three hundred years. But in the early part of the

nineteenth century the colonies revolted and established themselves as independent republics, modelled after the United States. They were led to fight for their independence partly because of the success of our own Revolution, but chiefly because of oppression by the Spaniards, who treated their colonies merely as sources of wealth.

Brazil also became independent of Portugal, and, after being for a long time ruled by an emperor, established a republican form of

government in 1889. Of late there have been many immigrants from European countries, especially from Germany and southern Europe. Special inducements have been offered to such colonists, and the recent development in portions of South America, particularly of Argentina and southern Brazil, has been partly due to these immigrants.

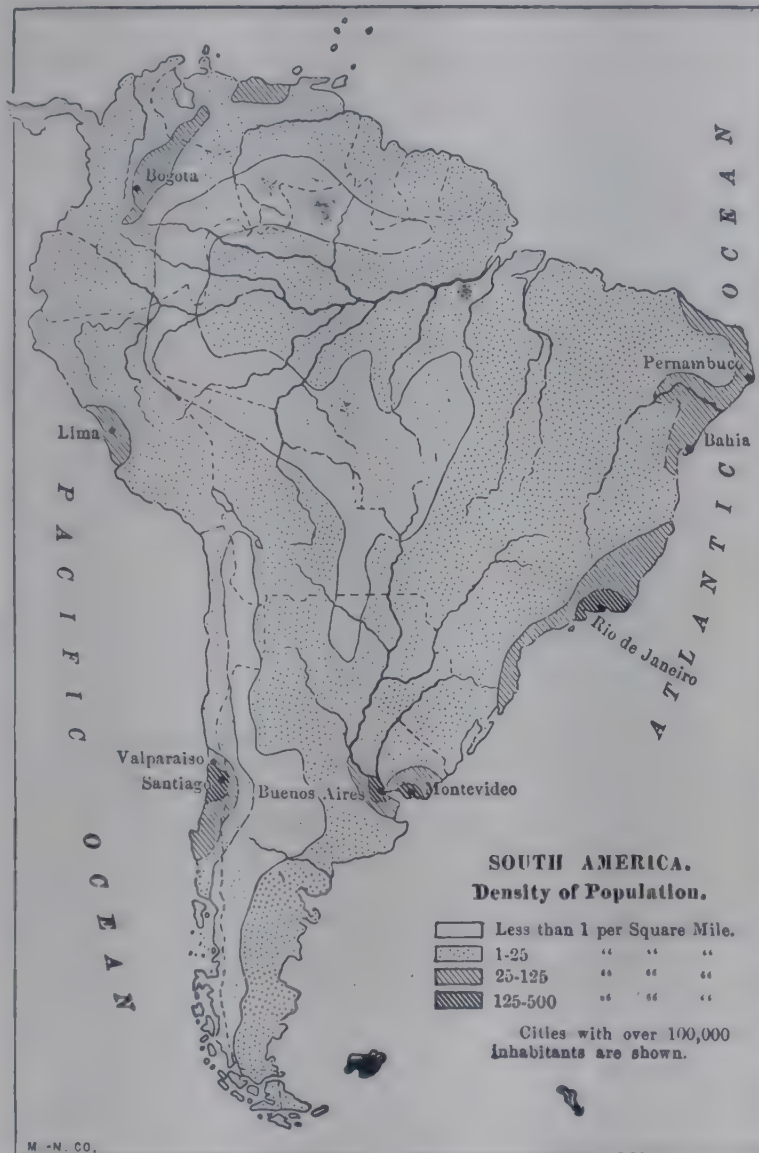


FIG. 85.

BRAZIL

Physiography and Climate. — This is the largest country in South America. It is even larger than the United States without Alaska, and nearly as large as Europe. While reaching north of the equator on one side, it extends into the south temperate zone on the other side. How many degrees of latitude does it include? Since so large a part of Brazil is in the torrid zone and on the eastern slope of the continent, its climate is not only warm but moist. Why the latter?

Eastern Brazil is a highland of ancient mountains worn down to the condition of hills and low mountains. Numerous streams drain this upland in various directions. Point out some of these and show where they empty (Fig. 75). Trace the divide between those flowing into the Amazon and Parana and those flowing into the Atlantic. What is the name of the largest river emptying directly into the Atlantic?

The northern third of Brazil is mainly a vast level plain, throughout most of its extent occupied by dense forest and drained by the Amazon. What is the condition on the campos? Why? (p. 55). The rainfall in the Amazon valley is so heavy, and the slope of the land so gentle, that the Amazon and its larger tributaries are swollen to great breadth. At times of flood the rivers overflow the surrounding country and transform it to an immense swamp through which many branching channels extend. In places the Amazon is several miles in width, and resembles a great lake rather than a river. Boats are able to pass up the Amazon nearly to the base of the

Andes, a distance of twenty-two hundred miles from the seacoast. Some of the tributaries are also navigable. Along the route of navigation there are settlements, such as MANAOS which is reached by ocean steamers; but at a distance from the river there is nothing but an almost unknown wilderness.

The Tropical Forest.—The Amazon forest offers a typical illustration of the tropical forest (Fig. 40) where plants, encouraged by the uniformly high temperature and great dampness, grow luxuriantly in the rich soil. Not only is the rainfall heavy, but evaporation is retarded by the dense vegetation, so that the forest

is reeking with moisture. Consequently at night time, when the temperature falls, such heavy dews collect that the plants are wet by them as by a rain.

In these woods there is occasionally a giant tree (Fig. 86) reaching to a height of from 180 to 200 feet and with a circumference of from 20 to 40 feet, while the distance to the lower limbs may be 100 feet from the ground. Between these

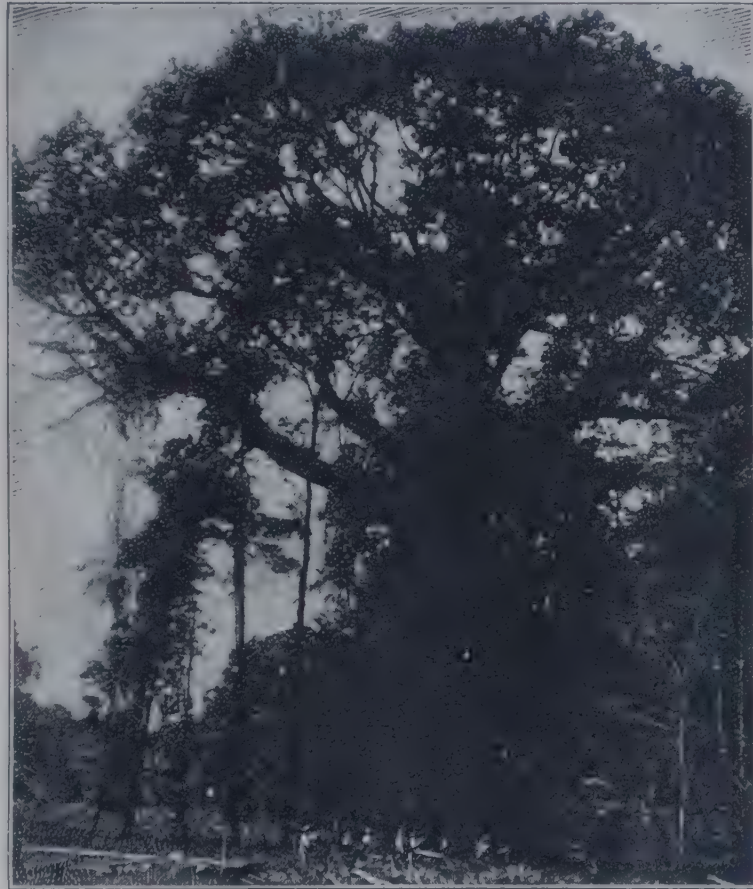


FIG. 86.

A scene in the tropical forest showing one of the giant trees from around which some of the undergrowth has been removed.

giant trees are smaller ones struggling to rise into the light, while in competition with them are shrubs, bushes, ferns, and many vines which twine about the tree trunks or hang from the lower limbs (Fig. 86). There are also *epiphytes*, or plants which, owing to the excessive moisture, are able to live cling-



FIG. 87.

Some of the Indians of tropical South America. Notice the nose and lip ornaments.

ing to others, with their roots in the air instead of the ground. Among the epiphytes are many beautiful orchids, including the *vanilla*, whose beans are of value in making perfumes and flavoring extracts.

One of the features of such a forest is the dense gloom and the silence, broken now and then by the crash of a falling tree, or the sorrowful notes of birds, or the frightful howling of

monkeys, or perchance the shrill scream of an animal which has fallen prey to the boa (Fig. 81). Why might we expect the animals in large part to be tree dwellers?

To one whose home is in the temperate zone the tropical forest appears very strange, for the woods are much the same throughout the year. There is no time when all the trees send forth their leaves and blossoms; nor is there a time when all the leaves change and fall to the ground. Some of the trees blossom throughout the year; others have their blossoms at

regular seasons; thus flowers and fruit may be seen at all times of the year.

Products of the Forest. — Among the trees of the tropical forest are many useful kinds. Some produce gums, such as *caoutchouc*, from which rubber is made; or edible fruits and nuts, or valuable timber and dyewoods. In fact, the name *Brazil* is derived from a word applied to a dyewood found in the Amazon forests.

Many of the inhabitants near the rivers, who have partially adopted the customs of civilization, make long journeys into the forest to collect the products, both for their own use and for shipment down the Amazon. But the difficulties of travel, and the warmth and dampness of the climate, are opposed to much work. Therefore the resources of this part of Brazil are only partially developed.

The natives still cultivate the *mandioca*, which was one of their principal sources of food when white men appeared. This plant has beneath the soil an enlargement of the root which in shape resembles a long sweet potato. A dish of dry meal, or *farina*, made from the *mandioca* is commonly seen on Brazilian tables, and it is often stewed with beans. *Mandioca* bears much the same relation to these people that wheat bears to those who live in temperate climates. It is from this plant that *tapioca* is made.

The Indians are also engaged in obtaining *rubber*, a product of immense importance because of its many uses, for example, as a packing around the valves of machinery, and as an insulator around wires and cables. Name other uses of rubber.

When gathering rubber, the natives encamp in the forest in lightly built huts (Fig. 88). Various paths through the dense undergrowth lead from these huts to the rubber trees which are scattered here and there. Each collector makes holes in the bark and inserts tubes of clay which carry the sap to bamboo dishes. Collecting the dishes from a number of trees, the

native returns to his hut and pours the contents into a larger dish, perhaps the shell of a large turtle.

The sap must then be subjected to a process of smoking, for if left standing too long the resin in it separates, and it is spoiled. As a result of the smoking, which is done by burning the nuts of a palm, the milky sap assumes a grayish yellow



FIG. 88.

An Indian hut on the Amazon.

color, and becomes firm. First one layer of sap is attached to a shovel and smoked; then another layer is added and smoked; and this is repeated until the coating of rubber on each side of the shovel is about eight inches thick. It is then cut off

and hung in the sun to dry, after which it is ready for shipment down the river to PARA; hence the name, Para rubber. Find this city on Figure 75. Rubber ranks next to coffee as an export from Brazil, and one of the principal markets for it is the United States.

Coffee Raising.—The coffee tree is a native of Abyssinia in Africa. It was introduced into Brazil in the eighteenth century, and has proved so successful that Brazil now produces more than one-half of all the coffee raised in the world. Coffee is cultivated all the way from southern Brazil to the Amazon, and it is estimated that there are fully five hundred million coffee trees in Brazil alone.

Coffee raising requires great care and expense. The plant must have a warm climate. It cannot stand extreme heat

or frost. The soil must be fertile, and the plant must be protected from winds. It grows best at altitudes of from fifteen hundred to forty-five hundred feet. First, the seeds are planted in nurseries; then, after twelve or eighteen months, they are set out in rows from five to eight feet apart. By careful pruning, the height of the trees is kept at about eight feet. The full crop is obtained in the sixth year, and the tree bears well until the twentieth year, each tree producing from thirty to forty pounds a year.

The small white flower grows in clusters, and the fruit, which is also clustered, looks somewhat like a medium-sized cherry. Inside of the husk are two kernels with the flat faces together. The berries are picked, dried in the sun, and hulled by machinery, the picking being done from April to September. After being sorted in the cities the coffee is shipped in bags. Formerly most of the Brazilian coffee left the port of RIO DE JANEIRO, but now more than half of it is sent from SANTOS. Coffee is the principal export of Brazil, and much of it comes to the United States.

Other Industries in Brazil. — On the highlands of Brazil, where coffee raising is carried on, other crops are also produced, such as cotton, sugar, tobacco, fruit, and corn. Much cocoa is cultivated in the tropical section, and in the extreme south many cattle are raised. The rocks of the highlands have produced some valuable minerals, especially gold and diamonds. Indeed, at one time, the southern part of Brazil was the principal diamond-producing region in the world. Both coal and iron are also present, though they are not yet mined.

Cities. — The capital and largest city of the republic is RIO DE JANEIRO, a city about as large as Boston, and the second in size in South America. It is situated upon a fine harbor (Fig. 89) and is surrounded by excellent farming country and coffee plantations. Several other Brazilian

cities are seaports connected with the interior by short railway lines which bring the coffee and other products for shipment. The most important are BAHIA, SANTOS, the seaport of SÃO PAULO, and PERNAMBUCO, the chief port for the export of sugar and cotton. Compare the size of each of these with some city in the United States (Tables

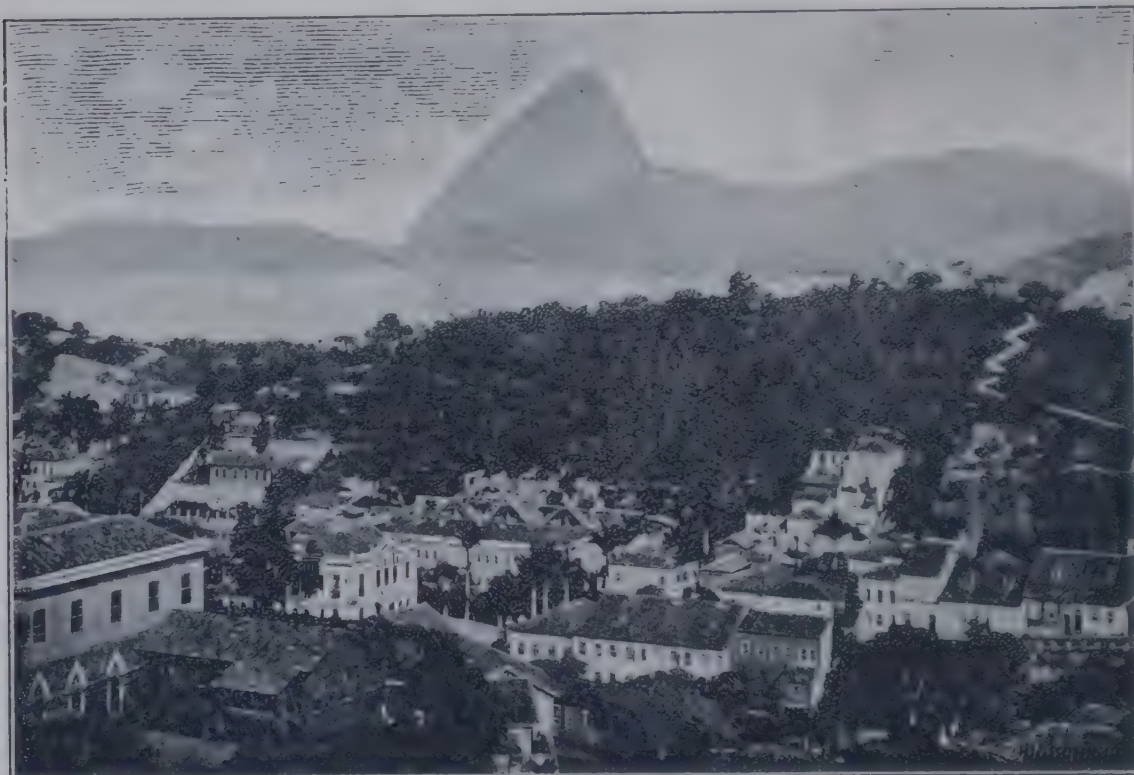


FIG. 89.

A part of the city and harbor of Rio de Janeiro.

just before Index). On the Para River, near the mouth of the Amazon, and connected with it by a branch of the river, is PARA, from which most of the rubber, vanilla, and other products from the Amazon forest are shipped to America and Europe.

ARGENTINA

Physiography and Climate. — This is by far the most advanced of South American countries, and the reasons

are not difficult to understand. In the first place, Argentina extends from just within the torrid zone to the extreme southern end of South America. Thus the country is for the most part within the temperate zone, whose climate is favorable to the development of energetic people. Also the *range* of climate, from arid to rainy (Fig. 26) and from tropical to temperate, insures a considerable range of products. A second reason for rapid advancement is the fact that, while there are mountains in the west, the remainder of the country is largely one vast expanse of *pampas* (Fig. 90). These open, treeless plains have made it easy for settlers to move about



FIG. 90.

On the pampas of Argentina.

and to carry on the industries of farming and ranching. This is quite in contrast to the unfavorable conditions in the Amazon valley ; but it may be compared with the ease of settlement which the plains and prairies of the United States have afforded.

Such favorable conditions have served to attract many immigrants from Europe, and there is, therefore, a larger percentage of pure-blooded whites here than in other parts of South America. Largely for this reason the government of Argentina is decidedly better than that in most South American countries.

Cattle Raising. — The open plains are well adapted

to ranching, and it is estimated that there are nearly one hundred million sheep and twenty-five million cattle in this country. Stock raising in Argentina differs in some respects from ranching in the United States.

In the latter country the cattle usually roam at large, sometimes straying over a hundred miles from home in their search for grass or for protection against storms. This makes necessary two round-ups every year, one in May or June, for branding



FIG. 91.

On the pampas of Argentina.

the calves and driving the stock back nearer the ranch house; and the other, early in the fall, for collecting the steers that are to be shipped to market.

In the United States sheep are likewise allowed to graze upon the "range" where there are no fences. They, however, are under the care of a herder who selects some spot near water for a camp, returning to shelter at night; and when the grass is eaten in one place, the camp is moved to a new centre.

While stock raising in some parts of Argentina is similar to that in the United States, the most advanced methods employed may be illustrated by the following brief description of one of the large cattle ranches.

This ranch contains over 74,000 acres, which are divided into three sections, each surrounded by wire fence. Each section is subdivided into smaller tracts by means of wire fences, the cost of fencing being fully as great as the original cost of the land. There are 22,000 head of cattle and 60,000 sheep divided into groups of from 4000 to 5000 head, each group being kept in one of the enclosures. They are thus prevented from straying, and require so little care that one man is able to take charge of a group.

All the animals are of the best breeds, and four hundred fine Durham cows are kept for the use of their milk in cheese manufacture. The chief profit of the ranch comes from the wool and skins of the sheep and from the sale of fat steers, usually sold when two years old. Many of the largest cattle and sheep ranches are owned by Englishmen and Scotchmen.

Formerly the herds roamed over the plains, feeding on government land, as is the custom in the United States. The government of Argentina, however, recognizing that ranching would be more successful if the cattle owners controlled large bodies of land, has been in the habit of selling large tracts to the ranchmen, who after purchase fence in their land. In western United States, on the other hand, ranchmen cannot obtain large tracts of government land because of the laws which restrict its sale to small blocks. But some of our western land, owned by the railways, can be bought in large tracts, and there the custom is growing to purchase and fence land, introduce better stock, and care for it, as in Argentina.

Farming. — The climate and soil in many parts of Argentina are favorable to agriculture. In the warm northern portion sugar-cane, coffee, and tobacco are produced; in the more temperate part, where the rainfall is sufficient, grains are raised and alfalfa for hay. There is also much fruit raising, especially grapes, from which wine and raisins are made.

Wheat is the most important agricultural product, the

value of the crop being fully \$50,000,000 a year, making the Argentine plains one of the great wheat-producing sections of the world. The climate is favorable, the soil fertile, and the land level or gently rolling, as in Minnesota and the Dakotas. Agriculture in the south is prohibited by the cold ; but sheep raising is carried on even in Patagonia and on the stormy islands beyond the Strait of Magellan.

Manufacturing and Commerce. — Besides the industries mentioned above, there is some lumbering and mining in the mountainous portion. But although the words *Argentina* and *Plata* mean silver, their use as proper names comes from the fact that the natives wore silver ornaments rather than from any abundance of the white metal in Argentina.

In the large cities there is considerable manufacturing, largely connected with the raw products of the country, as, for instance, dairying, woollen mills, flour, sugar, wine, and cotton manufacturing, the preparation of hides, etc. Nevertheless, a large part of the raw products is sent abroad, particularly wool, sheepskins, hides, wheat, corn, and meat. On the other hand, machinery, cloth, and other manufactured articles must be imported.

With such a development of the resources it is natural that there should be means of ready transportation. The broad Parana River, which empties into the Plata estuary, offers extensive water connection with the interior ; and railways ramify the well-settled portions of the country, connecting all the important cities. In fact, because of the superior development of Argentina there are more railways here than in any other South American country. In resources, industrial development, government, and educa-

tional system Argentina, of all the South American countries, bears the closest resemblance to the United States.

Cities. — By far the most important city is BUENOS AIRES, which is the largest city in South America, and considerably larger than St. Louis in the United States. There is a certain resemblance between Buenos Aires and New York, the metropolis of North America.

Each is situated on a good harbor on an estuary, and each has water connection with a very productive interior having a temperate climate. Moreover, from various parts of the interior, in each case, railway lines converge toward the seaport, while steamship lines extend to all quarters of the globe. New York, however, is a gateway to a much larger and more varied country, and one of greater resources. In addition, New York has been developed for a longer time. Consequently it is much larger than Buenos Aires.

Buenos Aires is a busy and rapidly growing city with much manufacturing, especially flour milling, brewing, and the canning and preserving of meat. It also has an extensive commerce. Just below the city, on the Plata estuary, is the seaport of LA PLATA; and upstream, on the Parana, is the rapidly growing city of ROSARIO, which is an important railway centre as well as a river port. In the interior are a number of towns and cities, among which the railway centre CORDOBA is the largest.

URUGUAY AND PARAGUAY

Uruguay. — Like so much of Argentina this is a region of plains, well watered and excellently adapted to agriculture. Naturally, therefore, cattle and sheep raising are important industries. But although the climate and soil are favorable to the same crops that thrive in northern Argentina, there has been little progress in agriculture. Indeed,

quite in contrast to its neighbor Argentina, this country is but slightly developed. The government is very bad indeed, for a few men control the army and make and unmake presidents almost at will.

The principal products of Uruguay are those connected with cattle and sheep; namely, dried beef, corned beef, ox tongues, hides, tallow, horns, sheepskins, and wool. The famous Liebig extract of beef is made in this country.



FIG. 92.

Ranch houses on the plains of Uruguay.

The company disposes of more than one thousand cattle a day during the summer months, and exports tongues, canned meats, beef extracts, and other products, to the value of \$15,000,000 a year.

The capital and largest city is the seaport of MONTEVIDEO, situated at one end of a semicircular bay on the Plata estuary.

Paraguay. — Like Bolivia this little country is without a seacoast, though it has access to the sea by way of the Parana River. It is a region of hills and plains covered with forests in part, but with many tracts of pasture land upon which large herds of cattle feed. The climate is hot and dry, with most of the hot winds from the north. For-

unately most of the rain falls during the hot summer when the ocean winds blow toward the heated land.

The agricultural products are those of the warm temperate and tropical zones, including tobacco, rice, sugarcane, and oranges, while from the forests rubber, dyewoods, and valuable timber are obtained. There is but one railway which connects the capital, ASUNCION, with Montevideo on the sea.

A peculiar product, and the principal export of this country, is *yerba maté*, or *Paraguay tea*. Although not used as extensively as our tea, which comes mainly from China and Japan, it is very popular in South America, where its use was learned from the red men. The tea is made by roasting and pulverizing the leaves of a wild holly, which, however, has lately been cultivated. South Americans drink this tea at their meals, and have become addicted to its use much as other people have to tea and coffee. Like tea and coffee, it is a stimulant, being considered very refreshing when taken by those fatigued.

THE GUIANAS AND VENEZUELA

The Guianas. — North of Brazil are three small countries, the only portions of the South American continent now under control of European nations. They belong to Great Britain, Holland, and France, respectively. Gold is obtained in each of the Guianas, although the development in this direction has gone little farther than the washing of alluvial gravels.

In these small countries a large part of the surface is still a forest wilderness inhabited chiefly by Indians who have little contact with white men. This tropical forest, like that of the Amazon, which it closely resembles, supplies rubber and valuable timber; but its resources are

only slightly developed. Near the coast, however, there is a strip of cultivated land from which is obtained sugar-cane, bananas, cotton, and a few other products. Of late, especially in Dutch Guiana, attention has been turned to the production of cocoa and coffee.

The Guianas are so slightly developed that there is but one short railway, and in most sections almost no roads.



FIG. 93.

A cocoanut grove on the northern coast of South America.

There are practically no exports except sugar, molasses, and rum — all made from sugar-cane. Flour, clothing, and other manufactured articles are imported.

British Guiana once belonged to the Dutch, who, coming from the diked lands of Holland, imitated the conditions of their mother country by building dikes to shut out the sea from an extensive mangrove swamp, which they transformed to tillable land. Even the capital, GEORGETOWN, is below the high-water mark. It is protected from the sea by a stone wall, and drained by means of steam pumps and by canals which open at low tide.

Dutch Guiana, once called **Surinam**, was originally settled by the British; but after the war with Holland, in 1667, it was

turned over to the Dutch in exchange for New York. It is easy to see that the Dutch did not get the better of the bargain. What is the capital of this colony?

French Guiana is even less developed than the other Guianas. The fact that it has been used as a penal colony for French convicts has given it a bad reputation and aided in preventing its settlement. Name its capital.

Venezuela.¹ — This country includes one of the spurs of the Andes and also a portion of the Guiana highland.



FIG. 94.

The lower Orinoco. Notice how broad it is and how deep it must be to float the large United States cruiser. Yet this picture is taken at Ciudad Bolivar, far up the river. Find it on the map, Fig. 75.

But a large part of Venezuela is occupied by the broad plains of the Orinoco valley. Some of these plains, the treeless *llanos* (p. 55), are the seat of extensive cattle raising, as in the case of the pampas of Argentina. In parts of Venezuela, for example upon the mountain slopes, are vast forests which produce valuable dyewoods and

¹ This name, which means "little Venice," was applied to the country because, when first visited in 1499, white men found an Indian village built on piles or posts in the water along the shores of Lake Maracaibo.

rubber. Among the mountains also are found valuable mineral deposits, especially gold.

There is some agriculture. Hardy crops, like potatoes, beans, and barley, are raised even at altitudes of eight thousand feet; but below five thousand feet are found such semi-tropical and tropical products as sugarcane, bananas, cocoa, and coffee (Fig. 95). The latter is



FIG. 95.

Drying coffee at Caracas. The dark-colored portion is covered with coffee grains.

the chief export; in fact, Venezuela is one of the leading coffee-producing sections of South America.

The capital, CARACAS (Fig. 96), five or six miles from the sea, is situated upon a highland over three thousand feet above sea level. It is connected with its ports by a short railway line which winds about in its descent to the sea.

In 1812 Caracas was visited by one of the most terrible earthquakes ever recorded. Being Ascension Day, a great part of the population was at church. The first shock caused

the bell to toll, but after all danger was thought past, there came a terrible subterranean noise, resembling the rolling of thunder, but louder and longer than thunder is commonly heard. Then came a shaking of the earth so tremendous that churches and houses were overthrown and the inhabitants buried beneath their ruins. On that day fully twelve thou-



FIG. 96.

The city of Caracas, nestled among the mountains.

sand persons perished. People were told that it was sent as a punishment for revolting from the rule of Spain.

TROPICAL ANDEAN COUNTRIES

Points of Resemblance. — These countries, Colombia, Ecuador, Peru, and Bolivia, are all crossed by the lofty Andes and are therefore mountainous. Each of them extends eastward beyond the mountains, to the plains of the upper Amazon and Orinoco valleys. In Colombia these plains include a portion of the llanos. Why then are they treeless? (p. 55). Elsewhere the plains are covered with a dense tropical forest (Figs. 40, 86, and 97), resembling that of the Amazon in density of plant growth and in human inhabitants. What can you tell about it then?

There is, of course, great variety of climate in this sec-

tion. Tropical heat prevails throughout the lowlands (Fig. 80); but the heavy rainfall near the equator contrasts strikingly with the arid conditions of southern Peru



FIG. 97.

Building houses in a clearing in the forest of Peru on the eastern side of the Andes.

and northern Chile, which lie in the belt of southeast trades (p. 34).

The elevation due to mountains and plateaus also causes differences in climate (p. 100). This may be illustrated by the vegetation. Up to an altitude of three thousand to four thousand feet, bananas, sugar-cane, cocoa, and other plants of hot climates flourish. Above this, to an elevation of six or seven thousand feet, the cooler climate permits the growth of tobacco, corn, and coffee. From this height up to about ten thou-

sand feet, wheat and our northern vegetables and fruits do well; but above ten thousand feet the bleak mountain peaks are too cold for farming. There is therefore a great variety of farm products in the western part of South America.

The fact that this section is so mountainous furnishes an explanation of its importance in the production of minerals. Both gold and silver ores, and other minerals as well, are found from the northern to the southern limit of the Andes, and this is therefore one of the great mineral-producing regions of the world. It was the abundance of precious metals which attracted the Spaniards to the continent.

The precious metals were mined for use in Spain rather than in the colonies. In fact, the welfare of the latter was not considered; and of the Spaniards who came to manage the mines and govern the people, few remained as permanent settlers. They exerted a destructive influence therefore, and the permanent population which they left consisted mainly of Indians and half-breeds.

Goaded by the Spanish misgovernment, these colonies revolted in the early part of the last century and established independent republics. But the nature of the population was such that *real* republican government was impossible. In each of the countries ambitious leaders, usually generals in the army, have again and again overturned the government after a revolution. This has seriously interfered with the development of industry and commerce; for not only have lives and property been lost, but a feeling of uncertainty has been introduced which has prevented settlers from coming, and capitalists from investing money for the development of the resources.

None of the capitals of the Andean countries are on the coast, and several are in the interior at a considerable elevation above sea level. In choosing such sites the Spaniards have had the example set them both by their Spanish ancestors and by the Incas; for Cuzco, the capital of the Incas, and Madrid, the Spanish capital, are both at a considerable elevation above sea level and many miles from the coast. The principal objects in the selection of these sites are to be near the mines, to secure a cooler and more healthful climate, and to obtain protection from attack by sea.

Doubtless another reason why these cities are not on the coast is the absence of good harbors. Throughout almost its entire extent, except in the cold southern portion of Chile, the coast is wonderfully straight. Why? (p. 99). Even in the present century the coast has risen several feet in a part of Peru and Chile. This uplift occurred during earthquake shocks, and it was, without question, the slipping of the rocks that caused the shocks.

Colombia. — This country, named after Columbus, includes the Isthmus of Panama, and therefore has seacoast on both oceans.



FIG. 98.

A native village in Colombia on the Panama Railway.

It is of especial importance to us, since the great Panama ship canal is being constructed across the narrowest part of the Isthmus. Of what advantage would such a canal be to the

United States? What two cities are located at the ends

of this proposed canal? A railway connects these two cities, and many goods are carried over it; for vessels approach from one side and unload and transfer their cargoes to the other ocean, where other vessels await. Thus the long voyage around South America may be saved.

It is in Colombia that several of the Andean ranges terminate, so that the western part of the country is very mountainous. Here there is much mineral wealth, gold and silver being of most importance, though emeralds of excellent grade are also obtained. In the eastern portion of the country, on the other hand, are treeless llanos on which large numbers of cattle are raised, as in Venezuela. Coffee is the principal agricultural product and the chief export; but sugar-cane, tobacco, and cocoa are also produced. On the mountain slopes the grains, fruits, and vegetables of temperate climates are grown.

Although the resources of Colombia are extensive, they have been little developed as yet. The present inhabitants are for the most part of mixed blood, uneducated, and unprogressive. There is practically no manufacturing, and it is even necessary to import some of the food that is consumed. Roads are few, and only about five hundred miles of railway have been built in the entire country. The Magdalena River, however, is navigable. What city is near its mouth?

BOGOTA, the capital and largest city, is situated far in the interior and at an elevation of about a mile and a half above sea level. It has an agreeable climate, even though within the tropics.

Ecuador.—Why should this name, the Spanish for equator, be applied to this country? In the Andes of Ecuador there are many volcanoes, including Cotopaxi, the

loftiest active volcano in the world, and Chimborazo, which is still higher but no longer active.

Naturally, because of its position, this country has a hot, damp climate near sea level (Fig. 80), but is much more temperate on the mountain slopes. The principal occupations are cattle raising and farming. The chief farm



FIG. 99.

A native house in Ecuador. Can you suggest reasons for building it on posts rather than on the ground?

products are wheat and barley on the highlands, and coffee, sugar-cane, and *cocoa* on the warm lowlands. The latter is the most important product of Ecuador, and fully one-fifth of all the cocoa produced in the world comes from there.

To cultivate cocoa the underbrush is cleared from the forest and cocoa trees are planted in the shade of the larger forest trees. This delicate plant requires not merely shade but also a warm, humid atmosphere with copious rains. At

the end of the fifth or sixth year, having reached a height of eight or nine feet, it begins to bear fruit. The tree, which at maturity is twenty or thirty feet high, has small pink and yellow blossoms which grow directly from the main trunk and branches. It blossoms throughout the year, and its leaves are always green.

From each blossom there develops a golden-colored pod, several inches in length, enclosing a number of seeds or beans which are surrounded by a cellular tissue. They are bitter and about the size of a large almond. After being washed, dried, and roasted, the beans are ready to be made into chocolate, which, because of its agreeable taste and nutritious qualities, is widely used as a drink and as an ingredient of candies. By what routes might cocoa well be shipped from Guayaquil to New York?

Another product of Ecuador, and of some other South American countries, is *sarsaparilla*, which is obtained from the large fleshy roots of a species of smilax. The juice from this root is much used in the manufacture of certain medicines. The rubber industry is also well developed; and now that the accessible supply from wild trees is becoming exhausted, attention is being given to the planting of rubber trees.

Even in the cities there is practically no manufacturing. One of the reasons for this is the almost total absence of roads, making the transportation of heavy machinery very difficult. This fact also interferes greatly with mining operations among the mountains. Therefore, although there is much gold and silver, mining is as yet slightly developed.

QUITO, the capital of Ecuador, is situated among the mountains of the interior at an elevation of about nine thousand feet. But the largest city is the seaport GRAY-AQUIL, the westernmost of the large cities of South America. It is in W. Long. 80°. Does it lie to the east or west of Washington?

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Peru. — The broad, forest-covered plains on the eastern side of the rugged Andes are drained by some of the larger headwaters of the Amazon, and thus Peru is provided with water communication to the Atlantic. While



FIG. 100.
A Peruvian Indian.

much of this dense tropical forest is an almost unexplored wilderness, the mountain valleys are settled mainly by the descendants of the Incas.

In Peru there are not only variations in climate due to altitude, as in Ecuador and Colombia, but also great differences in rainfall. The heavy fall of rain on the eastern side of the Andes offers a striking contrast to the arid and even desert climate along their western slopes (Fig. 26). State the cause of this aridity once more (p. 103). So little rain falls in southwestern Peru that in some parts, even close by the sea, there is an average of but one shower in seven years.

Peru was one of the most valuable sources of gold and silver for the Spanish conquerors. 'The Incas who dwelt there had accumulated gold for ornament,' and this the Spaniards seized. 'Then, opening mines, they forced the Indians to work as slaves. 'Since that time vast quantities of gold and silver have been obtained in that country, and valuable deposits of gold, petroleum, and copper have also been found.'

There is much agriculture in Peru, the principal crops being corn, wheat, and potatoes among the moun-

tains, and sugar-cane, cotton, tobacco, and coffee in the lower, warmer sections.' Even in the arid portion there is some farming ; for, as in southern California, the rains and snows of the mountains supply the short rivers with water for irrigation in the valleys and on the narrow



FIG. 101.

Ruins of an ancient Inca "palace" — an Inca Indian in the foreground.

coastal plains. Thus, even in the desert, there are gardens, vineyards, and fields of cotton and sugar-cane.

The Incas (p. 109) cultivated a number of native plants already mentioned. Can you name them? The value of *coca*, from which *cocaine* is made, was also taught by the Incas. This plant is cultivated in the warm valleys on the eastern slopes of the Andes, at an elevation of five or six thousand feet, where frosts are unknown. The leaves, after being dried in the sun, are chewed, and they produce such in-

vigorating effects that a small quantity enables one to endure great fatigue. Before the Spaniards arrived the leaves were highly prized; and to-day both coca leaves and cocaine are exported from Peru.

Chinchona, or *Peruvian bark*, from which the valuable medicine *quinine* is obtained, was also known to the Incas and is



FIG. 102.

A view of Lima. the capital of Peru.

still an important Peruvian product. It is obtained from an evergreen tree whose leaves resemble those of the laurel.

Before the year 1879 Peru was making rapid progress; but by a war with Chile at that time the nation became almost paralyzed. Although there is some manufacturing, especially connected with sugar production, most manufactured articles must be imported.

The Peruvians have built two railway lines into the mountains, one from the port of CALLAO, and another

from AREQUIPA to Lake Titicaca (Figs. 103 and 106). The first passes through Lima and then climbs the mountains, crossing deep gorges by means of high trestles, winding about on the very edges of precipices, tunnelling through the mountain rock, and finally crossing the western range of the Andes at an elevation of 15,645 feet.

LIMA, the capital (Fig. 102), founded by the Spanish conquerors in 1535, is situated at the base of the Andes. As in other Spanish countries the Moorish style of architecture prevails, and the houses are commonly built around

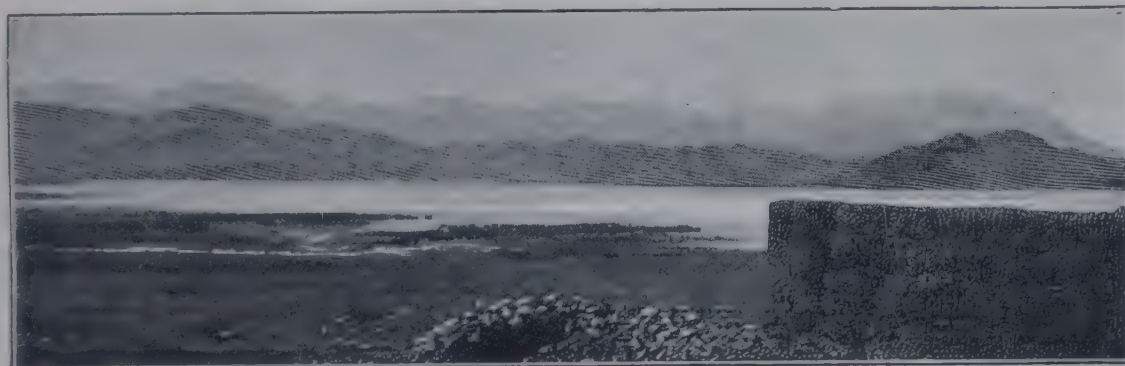


FIG. 103.

Lake Titicaca with the snowy ranges of the Andes in the far distance.

an open courtyard. The walls of the lower story are two or three feet thick, made of adobe or sun-dried brick; and if a second story is added, it is made of bamboo coated with adobe. By this method of construction, the buildings are better able to withstand earthquake shocks, and the inhabitants are in less danger from falling walls.

CALLAO, the seaport of Lima, is about seven miles from the capital. Its harbor is but little more than an open roadstead partially protected by an island on the southwest side. However, since the winds and ocean swells are from the south, while the coast is practically never visited by storms, this slight protection is sufficient.

AREQUIPA, at an elevation of seven thousand feet, is separated from the sea by sixty miles of desert. Cuzco, the old Inca capital, is on an interior table-land, at an elevation of over eleven thousand feet. The ruins of the Inca citadels and "palaces" (Fig. 101) are still to be seen, and many pure-blooded and half-breed Incas still dwell in and near the city.

Bolivia. — This country, named after General Bolivar, the great South American leader in the revolt against



FIG. 104.

A stage coach fording a stream in Bolivia. From this it will be seen how difficult it would be to draw heavy machinery.

Spain, was robbed of its seacoast by Chile during the war between Chile and Peru. What other South American country has no seacoast? In a broad valley between the mountains is Lake Titicaca (Figs. 103 and

106), partly in Peru and partly in Bolivia. This lake, the greatest in South America, is a third as large as Lake Erie; and its elevation, twelve thousand five hundred feet above the sea, makes it the most elevated great lake in the world.

The Incas occupied this region also, and mined much gold. Besides gold the Spanish have found veins of copper, tin, and silver, so that mining has been one of the most important industries of the country. It is said that over three billion dollars' worth of silver has been secured since the Spanish discovery. Bolivia is also one of the great tin-producing countries of the world.

The mining and reduction of the ore are done by very crude methods. For example, instead of using costly machines for



FIG. 105.

A group of llamas in the Andes.

crushing the ore, as in the United States, one method followed is to roll boulders around on the ore until it is crushed. Since there are practically no railways, goods are transported for the most part by trains of pack-mules, donkeys, alpacas, or llamas (Figs. 79 and 105). The llama here, as in Peru, is of great value to the inhabitants, not merely as a beast of burden, but also as a source of wool for clothing.



FIG. 106.

An Indian boy in a rush boat on Lake Titicaca. The fact that rushes are still used in making boats shows how these people cling to ancient customs.

Much of eastern Bolivia, like eastern Peru and the Amazon valley, is an almost unknown forest wilderness. But in the mountain valleys and on the plateaus agriculture is carried on, with products similar to those of Peru. Most of these are consumed at home, though some coffee is exported. The farming methods are very crude. For example, the wooden plough, resembling that used by the ancient Egyptians, may still be seen, being drawn by cattle yoked behind the horns. Doubtless such methods are partly explained by the fact that not more than a quarter of the people have any white blood.

A railway line connects western Bolivia with the sea. Better railways and the improvement of the rivers, so as to permit river transportation to the Atlantic, are among the greatest needs of the country. Through what rivers could boats pass to the sea? Find the capital of Bolivia. LA PAZ, the largest city, has twice as many inhabitants as the capital.

CHILE

Physiography and Climate. — Since the divide between the Atlantic and Pacific drainage forms the eastern boundary line of Chile, the country is very narrow in an east and west direction. It is also very mountainous (Fig. 107). Much of the coast line is regular like that of the rest of South America; how is it with the southern portion?

The climate varies more than that of any other South American country. The northern part is within the torrid zone, while the southern end reaches far into the bleak south temperate zone (Fig. 108); and on the mountain slopes there is every climate from frigid¹ to torrid.

¹ The name *Chile* is derived from an Indian word signifying snow.

Moreover, northern Chile is arid and in places an absolute desert; but central and southern Chile reach into the rainy belt of prevailing westerlies (Fig. 29). The most fully settled and best developed section lies in the middle part between the hot, arid north and the bleak, rainy south. This portion of the coast is bathed by a cold current from



FIG. 107.

Snow-covered mountains of Chile.

the south, which cools the atmosphere of Chile as the Labrador current chills that of New England (Fig. 38).

Mineral Wealth.— There is much mineral wealth, including lead, silver, coal, and copper. The latter is of such importance that Chile, like the United States, is one of the great copper-producing countries of the world. There are also beds of nitrate of soda which were captured during the war of 1879–80, and at present yield the government an annual income of fully \$10,000,000. Nitrate is the principal export.

The nitrate beds occur in the midst of the desert of Atacama, in which rain almost never falls. The substance occurs in layers a few inches to one or two feet thick, over an area thirty

or forty miles in breadth. In color it varies, being white, yellow, blue, brown, etc., according to the impurities contained. After being dug out, the pure nitrate is dissolved and separated from the impurities, and then sold. Its chief use is that of a fertilizer, for which purpose great quantities are shipped from the port of IQUIQUE. It is believed that the nitrate was deposited in lagoons which were shut off from the sea and subjected to evaporation in the arid climate.

Agriculture, Manufacturing, and General Development.

— There is much agriculture in Chile, especially in the

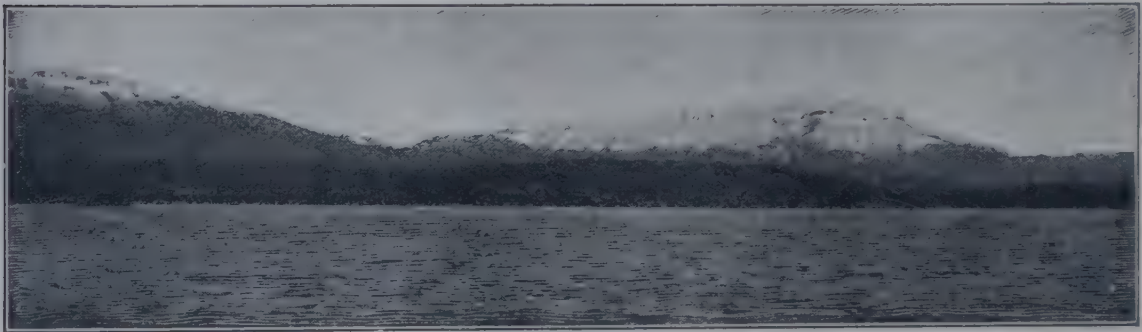


FIG. 108.

A view in the Strait of Magellan at the bleak southern end of Chile. Snow remains on these mountains throughout the year.

rainy middle portion. The principal crops are the various grains, tobacco, and vegetables, thus resembling agriculture in many parts of the United States. More wheat and barley are produced than are needed at home, so that Chile helps to supply other nations with grain. Large herds of cattle are also reared, and sheep raising is one of the chief industries in southern Chile. Hides, shoe leather, and wool are exported. More manufacturing is carried on than in most South American countries, the principal kinds being flour milling, cheese making, tanning, and shoe manufacturing; but as elsewhere on that continent, machinery and many other manufactured articles are purchased in Europe and the United States.

Chile is one of the most progressive countries in South America. Its government is stable, and its industries are well developed. This progress is doubtless in large part due to the temperate climate, which requires energy on the part of its inhabitants, and invites settlers from the temperate climate of Europe. It is interesting to note that the two most advanced nations of South America lie side by side in the temperate zone.

Cities. — The principal cities are SANTIAGO, the capital and largest city, situated inland, and VALPARAISO, its seaport. As at Callao (p. 139), the harbor of Valparaiso is open to the north; but this is not a serious objection, because the wind seldom blows from that quarter.

ISLANDS NEAR THE CONTINENT

The *Galapagos*¹ *Islands*, about six hundred miles west of Ecuador on the equator, are a group of small volcanic islands owned by Ecuador. They are too far from the continent to show on our map. When discovered they were uninhabited by man, and the only large animals living there were gigantic tortoises, which wandered about in great numbers, free from danger of enemies.

Just east of the southern tip of South America are the *Falkland Islands*, which belong to Great Britain. Their surface is hilly and rugged, and the climate is raw. There is some sheep raising and fishing. Still farther east are the islands of *South Georgia*, also British. They are inhospitable, ice-bound lands with no permanent inhabitants. Yet they are no nearer the south frigid zone than are parts of Great Britain to the north frigid zone. But while Great Britain is bathed by a warm current, South Georgia is swept by cold, ice-laden currents from the Antarctic, pushed forward by the prevailing westerlies (Fig. 38).

¹ A Spanish word for tortoise.

Just off the coast of Venezuela, opposite the mouth of the Orinoco, is the low island of *Trinidad*, also a British possession. This island is especially noted for its extensive pitch lake, from which asphaltum is obtained for use in making asphalt pavements. The asphaltum oozes slowly from the ground, and, as it is dug out, more oozes forth, as if there were an inexhaustible supply beneath the surface.

West of Chile, and belonging to that country, is the island of *Juan Fernandez*. This is the island where Selkirk was wrecked, and by some is thought to be the island home of Robinson Crusoe. It seems quite certain, however, that Defoe described Tobago just north of Trinidad.

REVIEW QUESTIONS.—(1) State some resemblances between South America and North America. (2) Describe the highland regions. (3) The lowlands. (4) In what respects do North and South America differ? (5) Tell about the differences in temperature in different parts of South America. (6) Explain the regions of heavy rainfall. (7) Where are the arid belts? Give the reasons. (8) What about the rainfall in the south? (9) Why does the rainfall vary with the season in the tropical belt? (10) What differences in the plant life are found in South America? Why? (11) Tell about the animals of the tropical forest. (12) Of the plains and mountains. (13) Describe the Indian life in the forest. (14) What can you tell about the Incas? (15) State the main facts in the history of South America since the whites came. (16) Describe the principal physiographic features of Brazil. (17) What are the variations in climate? (18) Tell about the influence of rainfall upon the vegetation and the rivers. (19) Describe the tropical forest of the Amazon. (20) What valuable products are found? (21) What can you tell about mandioca? (22) Describe the gathering of rubber. (23) Tell about coffee raising. (24) What other products come from Brazil? (25) Name and locate the principal cities; what can you say about each? (26) Describe the physiography of Argentina. (27) What influence have the physiography and climate had upon development? (28) Describe ranching in Argentina. (29) How does it differ from that of the United States? Why? (30) What are the principal farm products? (31) Tell about manufacturing. (32) About commerce. (33) How does Argentina differ from many other South American countries? (34) Compare Buenos Aires with New York.

(35) Locate the other cities named. (36) What are the industries of Uruguay? (37) Name the capital. (38) Compare Uruguay with Argentina. (39) What about the climate and products of Paraguay? (40) Tell about Paraguay tea. (41) Name the three Guianas. (42) What are the conditions and products? (43) What can you tell about British Guiana? (44) About Dutch Guiana? (45) About French Guiana? (46) Describe the physiography of Venezuela. (47) What are the principal industries? (48) What can you tell about Caracas? (49) Name the Andean countries. (50) Tell about the climate, its variations, and influence on the farm products. (51) What about the minerals? (52) What was the influence of the Spaniards? (53) Give reasons for the locations of the capitals. (54) Of what importance is the Isthmus of Panama? (55) Describe the physiography and industries of Colombia. (56) What about the capital? (57) Tell about the effect of climate on the industries in Ecuador. (58) Describe the cultivation of the cocoa plant. (59) Name some other products. (60) Why is there little mining and manufacturing? (61) Locate the principal cities. (62) Tell about the physiography and climate of Peru. (63) About the minerals and agricultural products. (64) What products did the Incas cultivate? (65) Tell about the railways. (66) Locate and tell about the principal cities. (67) What about the large lake in Bolivia? (68) Tell about the mining. (69) The other industries. (70) The transportation of goods. (71) Describe the physiography of Chile. (72) The climate. (73) What mineral products are found? (74) Tell about the nitrate of soda beds. (75) What other industries are developed? (76) Why is Chile so progressive? (77) Locate the two largest cities. (78) Locate each of the island groups mentioned. For what is each important?

REVIEW AND COMPARISON WITH NORTH AMERICA.—(1) Which of the two Americas has the advantage in regard to latitude? Show how. (2) Tell about the effects of the trade winds in each continent (Figs. 26 and 30). (3) Of the prevailing westerlies (Figs. 29 and 30). (4) Locate the arid sections in each continent, and give the reasons for the lack of rain (Figs. 25 and 29). (5) Point out the rainiest section in each and state the causes. (6) Which of the two continents has the better position for world commerce? Why? (7) Into what ocean do the principal rivers of South America flow? Of North America? (8) What can you say about the regularity of the coast of the two grand divisions? Which has the advantage in this respect? How? (9) Locate the principal coast cities of South America. Of

North America. Give the main advantages of the location in each case. (10) What about the number of lakes in each continent and their value for commerce? (11) What interior cities in each continent can you locate? (12) Compare both Brazil and Argentina with the United States in area. In population. (13) Compare Chile with Texas in these two respects. (14) What important farm products are common to South America and the United States?¹ (15) Name some products that are extensively raised in one and not in the other. (16) Which parts of each continent are especially noted for cotton? Coffee? Wheat? Cattle and sheep? Copper? Precious metals? (17) What is the prevailing kind of government in North and in South America?

SUGGESTIONS. — (1) Give several reasons why South America has been much less rapidly settled than North America. (2) What parts of North America have been rising and on that account possess few good natural harbors? (3) How does the Spaniards' treatment of the Incas compare with their treatment of the North American Indians? (4) Write a description of the Brazilian forest with its animal life. (5) Find out some of the ways in which coffee is often adulterated. (6) Make a sand model of South America. A drawing. (7) If you were expecting to emigrate there, where would you prefer to settle? Why? (8) What products of South America are you probably seeing and using from week to week? (9) Is Brazil likely to rival the United States in importance in the future? Why? (10) What are the prevailing languages in South America? How has that come about? (11) How do you account for the similarity in the governments of North and South America? (12) Is it an advantage or a disadvantage for South America that it has so many more countries than North America?

¹ Help in answering questions 14 to 16 may be obtained from the two closing sections of the book.





OCEANO

Dnieper R.

St. Petersburg

Ural Mts.

ASIA

Dnieper R.

Volga R.

Caspian Sea

Caucasus Mts.
Mt. Elbruz

Black Sea

Constantinople

RELIEF MAP
OF
EUROPE

Scale of Miles
0 100 200 300 400 500 600



PART III

EUROPE



THE continent of Europe was named when only the southern part of it was known; that is, the portion that is separated from Africa and Asia by water. On Figure 109 find what these bodies of water are called. As exploration extended, it was found that Europe was really continuous with Asia, being in fact a great peninsula extending westward. Europe and Asia together actually form a single continent called *Eurasia*; but since Europe has been long considered a separate continent, and has figured so prominently as the home of the civilized races, it seems best to treat it separately.

On the map (Fig. 172) trace the boundary between Europe and Asia. Make an outline map, inserting the boundaries and names of the European countries. Add the names of the seas and the larger islands. What countries are partly or wholly on peninsulas? Add to the map the large rivers with their names. Where are the chief divides? Mark with heavy lines the location of the principal mountains (Fig. 109). Write their names on the map. From what has previously been learned, what can you tell about the people of Europe? About the climate? What does the peculiar condition of the Caspian Sea tell about the climate in that section?

IX. PHYSIOGRAPHY, CLIMATE, AND PEOPLE

PHYSIOGRAPHY

Highlands and Lowlands. — As in the case of North America, the development of the continent of Europe has required millions of years. Far back in time mountains appeared above the sea in the northwestern portion of the



FIG. 110.

A view over the snow-capped peaks of the Caucasus Mountains. A sea of fog fills the valley.

continent. Although greatly worn by the weathering of the ages, and much reduced in elevation, these mountains may still be seen in Finland, Scandinavia (the peninsula occupied by Norway and Sweden), and Scotland (Figs. 127 and 129), as well as in Germany and Belgium. They re-

semble the mountains of New England and eastern Canada, that have likewise been greatly worn by weathering.

Other mountain ranges were later formed in southern Europe; but, like those of western America, they are young and their recent growth has been vigorous. There-



FIG. 111.

Lake Geneva in a valley among the Alps. The Rhone River flows out of this lake.

fore the *Pyrenees* (Fig. 155), *Alps*, and *Caucasus* (Fig. 110) are still of great height. Find each on Figure 109. The mountains of North and South America form continuous chains, with the highest mountains in the belt extending north and south. But in Europe the loftiest mountains are in the south, extending in various directions, though mainly east and west.

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dition promise a different effect on the climate? It is to the fact that the mountains are not continuous, and that they consist of chains extending in various directions, that Europe owes much of its extremely irregular outline.

Besides the mountains mentioned, there is a long, low chain, known as the *Urals*, which extends north and south on the eastern side, and for a part of the distance forms the boundary between Europe and Asia. Other scattered highlands are shown on Figure 109. Where mainly are they situated?

Next to the Caucasus (Fig. 110) the loftiest of all these mountains are the Alps (Figs. 111, 201, 204, and 205), whose rains and snows find their way to the sea through several of the large rivers of Europe. What are some of their names (Fig. 172). Headwaters of four of these rivers are within forty miles of each other in the Alps. What large rivers of Europe do not rise in the Alps (Fig. 109)?

Between the low mountains of the north and east and the higher ranges of the south there is a very extensive lowland (Fig. 109).

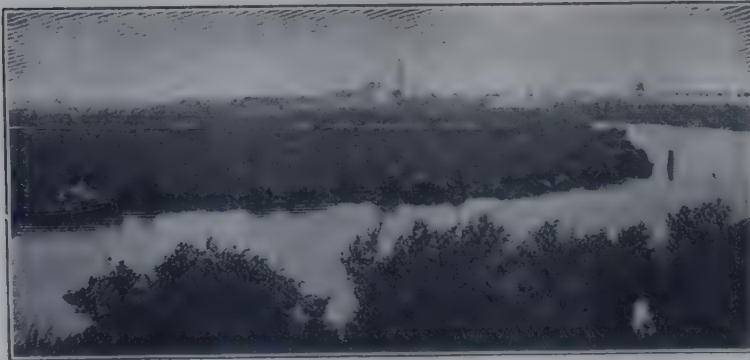


FIG. 112.

Looking across the level plain of North Germany.
Peat is dug on this plain near the river.

A part of this has been submerged by the sinking of the land, thus forming the shallow Baltic Sea. Beginning in the west with southern England, and

passing through Belgium and Holland, or the "Low Countries," this plain broadens as it extends eastward across Germany (Fig. 112) until it includes almost all

of Russia (Fig. 109). Estimate its length east and west. About two-thirds of Europe is included in this plain.

Some of the streams in the mountains, as in Scandinavia and Switzerland, have abundant water power; but most of the rivers flow with gentle slope over broad plains. As a result, most of the rivers are navigable for long distances; for example, the Seine for 350 miles and the Rhine for 550 miles. The level plains also encourage the building of canals; and thus, by river, canal, and lake, the Black and Caspian seas are connected with the Baltic and North seas; and the North and Caspian seas are connected with the Mediterranean.

Coal Beds. — While these mountains and plains were forming, coal beds were also accumulating, as was the case in America during the *Coal Period*.

Vast swampy tracts were covered with a luxuriant vegetation; then this land was lowered beneath the sea, and the plant remains became covered over and pressed closely together by the weight of thick layers of sand, gravel, and mud. After a while the sea bottom emerged once more, and rank vegetation returned, but this time with its roots in the ocean mud that had buried the earlier swamps. In the course of hundreds of years the land again sank and the plants were covered much as before. Thus one layer of dense vegetation after another was buried deep in the earth; and there it has slowly changed to the coal that is of so much use in warming houses, cooking food, and running machinery.

Figure 113 shows the parts of Europe in which coal beds occur. In what countries are they? Most of the coal is *bituminous* or soft coal, though there is some *anthracite*. In a number of sections *lignite* or brown coal is mined. This is a poor variety formed in much the same way as the bituminous, but at a later time than the Coal Period. *Peat* (Fig. 112) is also dug for fuel in western Europe, where the damp climate favors its formation.

The Great Ice Sheet. — At the same period that eastern North America was invaded by a great ice sheet from the north, snow accumulated on the highlands of northwestern



FIG. 113.

Coal map of Europe.

Europe and spread outward in all directions. Figure 114 shows the extent of the European ice sheet.

One glacier, with its centre in the Scandinavian peninsula, spread southward over the Russian plains, and into Germany and Holland. Smaller ice sheets were developed in the highlands of Scotland, Ireland, and Wales; and these, united, covered all the British Isles, excepting the extreme southern part (Fig. 114). The British glaciers also flowed out into the North Sea and joined forces with the Scandinavian glacier

During this same period the glaciers of the Alps and other mountains were much more extensive than now, extending far down the mountain valleys. These facts are known by the deposits of drift that the ice left, by the boulders and pebbles



FIG. 114.

Ice sheet.

that the glacier moved, and by the scratches that were made on the rock as the ice dragged these fragments along.

In Europe, as in North America, the ice cap was over a mile thick; and when it slowly moved over the surface it swept away the soil that had accumulated, and ground the rock fragments to bits. These bits of rock it deposited elsewhere as *drift*, so that, while the bed rock was left bare in some places, in others it was covered with a deep glacial soil containing boulders and pebbles. In

many places the drift blocked the stream valleys and thus caused innumerable falls and small lakes. In Figure 109 note the distribution of lakes in Europe (see also Figs. 122 and 200).



FIG. 115.

A *fjord* on the coast of Norway — a mountain valley into which the sea has been admitted by sinking of the land. (See also Fig. 173.)

The greater number of these lakes are too small to be shown on our maps. Of what service are lakes and falls to man?

The Coast Line.

—The irregularities of the coast line of northern Europe, like those of northeastern North America, are due to the sinking of the land. The Baltic Sea and its gulfs represent old land valleys; and the hills of this submerged land form either islands, peninsulas, or shallow banks where food fish abound.

It seems to be well proved that, before the Glacial Period, the British Isles were connected with the mainland by low plains where the North Sea and English Channel now exist. An elevation of only a few hundred feet would restore this condition by changing the bed of the North Sea to dry land. This would then extend the continent westward beyond the British Isles, thus destroying the bays and harbors, and altering the entire outline of northwestern Europe.

In southern Europe the rising and sinking of small areas of land — while the mountains were forming — has

made many peninsulas, with bays, gulfs, islands, and seas between. The Mediterranean itself occupies a basin, thousands of feet in depth, formed by the sinking of this part of the earth's crust. Some of these islands, however, are partly or wholly built up by volcanic action. What volcano is on the island of Sicily (Fig. 200)?

As a result of all these land movements, Europe has the most irregular coast of all the continents. Name its large peninsulas. How many of them are mountainous? Name the larger gulfs and seas that border the continent. How about the number of fine harbors? Show by examples how this great irregularity of the coast is of advantage in allowing vessels to proceed far into the interior of the continent.

CLIMATE

Influence of Latitude. — Trace the 50th parallel of latitude on a globe or map of the world. Notice that while the 49th parallel forms the northern boundary of western United States, it passes entirely south of England, crosses France near Paris, and extends through southern Germany and Russia. From this it is evident that by far the larger part of Europe lies farther north than the United States, and due east of Canada. St. Petersburg is in the same latitude as northern Labrador; and the tips of the peninsulas of southern Europe reach about as far south as the southern boundary of Virginia.

In the far north, near the Arctic, the climate is bleak, and there are barren, frozen tundras. South of this is a belt of fir, spruce, and pine, like that which stretches east and west across central Canada. But contrary to what might be expected from latitude alone, the climate in and just south of this belt of evergreen forest permits the

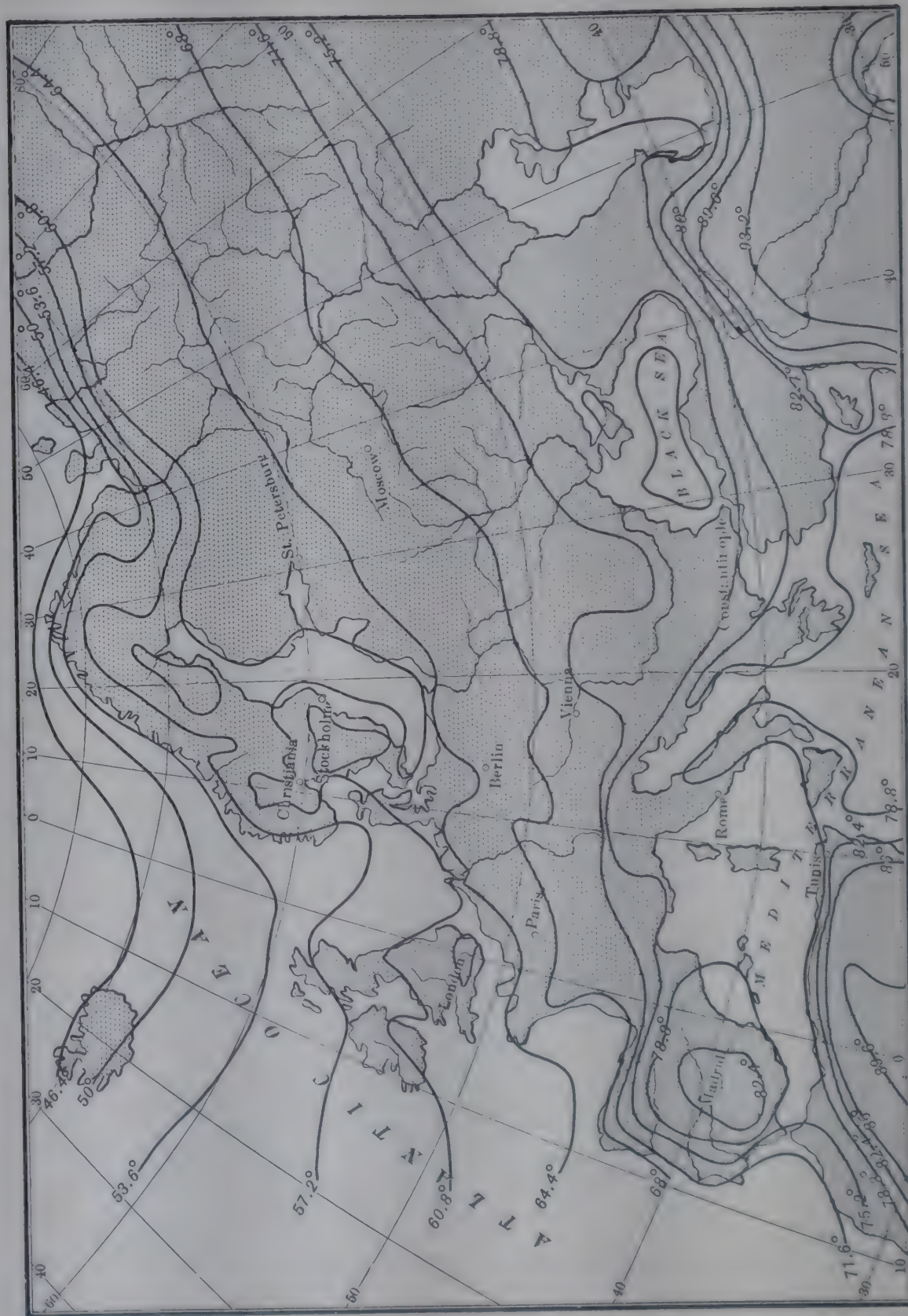


FIG. 116.

Isothermal chart of Europe for July. (The figures are given for tenths of degrees Fahrenheit — for example 60.8 — because the map was made from one in which the Centigrade scale was used.)

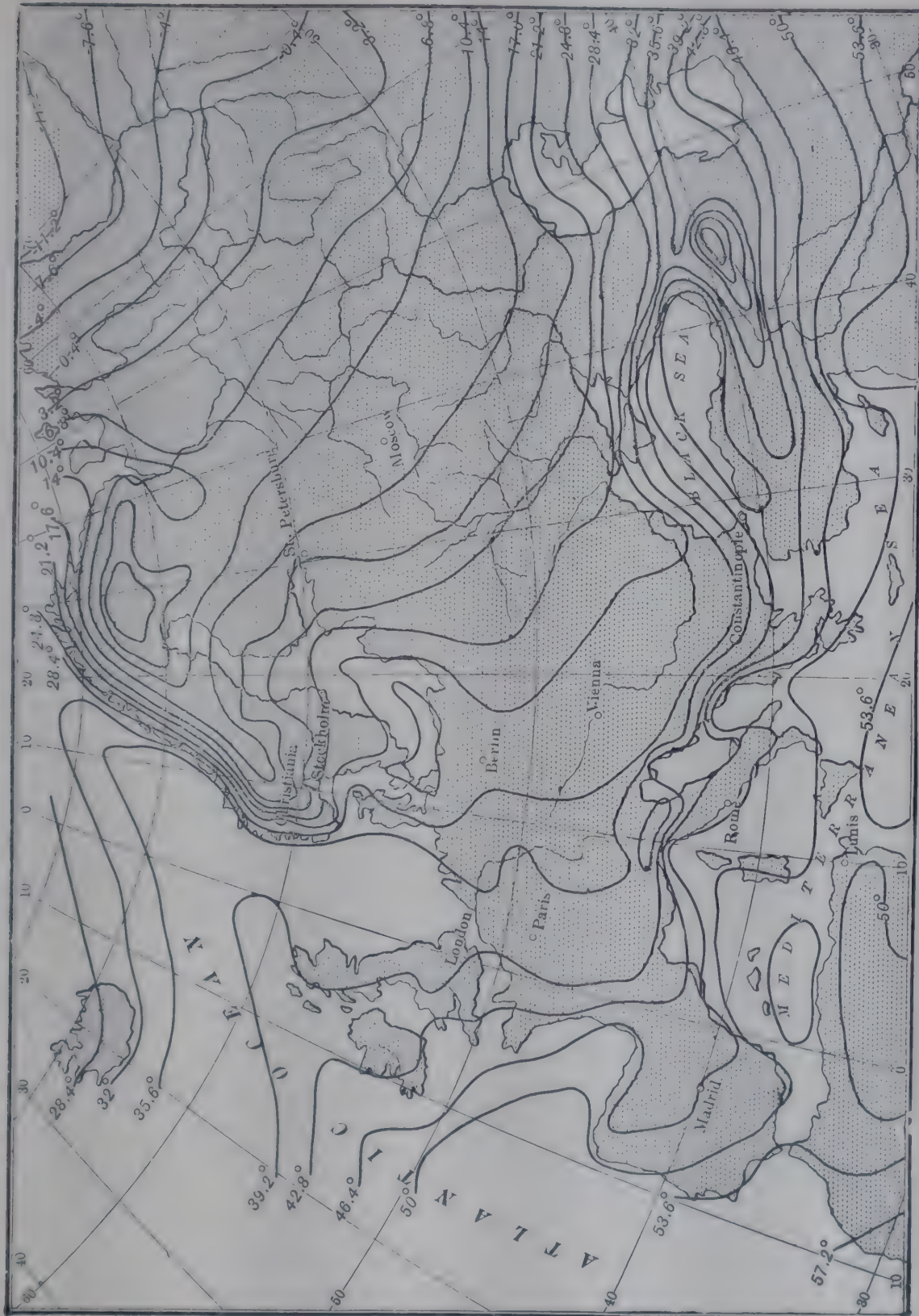


FIG. 117.
Isothermal chart of Europe for January.

growth of the grains and fruits that flourish in southern Canada and northern United States. In southern Europe, in the latitude of central United States, such semi-tropical fruits as oranges, lemons, olives, and figs are cultivated. That is to say, the products of the greater part of Europe are such as grow several hundred miles farther south in eastern North America.

That these products are raised in great abundance in Europe is indicated by the number of people there ; for, although the continent is much less than half the size of North America, it supports four times as many inhabitants, or nearly 400,000,000. Let us see the explanation of these remarkable facts.

Resemblance to Western North America. — In several respects the climate of Europe is so similar to that of western North America that a brief review will be useful. It will be recalled that our western coast, north of San Francisco, is under the control of the prevailing westerlies (Fig. 25). These winds from the Pacific so temper the cold of winter and the heat of summer as to produce a very mild climate for some distance inland ; but toward the east, or interior, the influence of the ocean decreases and the extremes of temperature become greater. South of San Francisco the influence of the horse latitudes and the trade-wind belts is felt, and whatever wind there is, usually blows either along the coast or from the land.

The vapor-laden westerlies, rising over the highlands north of San Francisco, cause an abundance of rain, so that western Washington and Oregon have the heaviest rainfall in the United States. In crossing the mountains, however, the winds are so deprived of moisture that the plateaus and plains beyond are arid (Fig. 30). Southern

California has rain in winter, especially in the mountains ; but in summer, when the trade-wind belt has moved northward (Figs. 31 and 32), the winds blow either along the coast or from the land. Therefore the climate is so dry that agriculture can be carried on only by irrigation.

Now turn to northern Europe. The prevailing westerlies are felt there as in the United States. Blowing from the ocean, and, what is especially important, from across the warm ocean current (p. 50), they distribute an enormous amount of heat over the land. It is the westerlies from these warm waters, more than any other factor, that allow crops to be raised nearer the pole in Europe than in any other part of the globe. If these conditions were not present, much of that densely populated continent (Fig. 120) would be a barren waste, like Labrador.

The effect of the ocean winds is naturally greatest near the coast, as in western North America. Therefore England has a mild, rainy climate ; but the farther eastward one goes, the less is the influence of the ocean. Thus eastern Russia experiences great extremes of heat and cold, and there is danger of serious droughts. Compare the summer and winter temperature (Figs. 116 and 117) and the rainfall (Fig. 118) of these two sections.

Southern Europe, like southern California, is not affected by the westerlies in summer, for it lies then within the belt of the horse latitudes. This accounts for the fact that southern Spain, Italy, and Greece receive very little rain in summer. Examine Figure 118 to see where in Europe the rainfall is light. Find some places where there is abundant rain on mountain slopes.

Influence of Cyclonic Storms. — Thus far we have seen a striking resemblance in the climates of the two conti-

nents. But there are also notable differences. The westerlies are less regular in Europe than in western North America because of frequent interruption by the cyclonic storms, which, after passing over eastern North America, often cross the ocean and continue across Europe (p. 35). Why cannot their arrival be predicted as well as in the United States?

As in eastern United States and Canada, the cyclonic storms cause variable winds (Fig. 35). For example, when a storm centre is west of the British Isles the westerlies are checked and the winds blow toward the centre, or *from the east*. But while storm winds from the east bring rain to eastern North America, the same kind of winds cannot bring rain to eastern Europe, because there is no great ocean near at hand to supply the vapor. On account of the absence of ocean water, therefore, eastern Europe has little rain, as eastern America would have if there were land instead of water to the east of it.

Effect of Mountain Ranges. — The direction in which the highlands extend is a second cause of great difference between the climates of Europe and America. In America, where high mountains extend north and south along the entire western margin of the continent, the warm, damp westerlies are soon deprived of their moisture. This leaves a vast arid and semi-arid area in the interior.

In Europe, on the other hand, where the higher ranges extend nearly east and west, the mountains do not so seriously interfere with the movement of vapor to the interior. Consequently the west winds surrender their moisture only very gradually. This accounts for the fact that in the belt of westerlies, from western Ireland to eastern Russia, there is rainfall enough for agriculture.

The east-west direction of the lofty mountains has a marked influence on the climate of those portions of Europe that lie

on their north and south sides. Rising like great walls, the mountains prevent south winds from bearing northward the heat of the Mediterranean basin; and they also interfere with the passage of the chilling winds from the north. We know that Florida, much farther south than southern Europe, is



FIG. 118.

visited by cold waves and accompanying frosts; but mountain barriers prevent such winds in portions of southern Europe.

Inland Seas. — The numerous inland seas are another great factor in influencing the climate of parts of Europe. Draw a sketch map of Europe, locating these seas. How does the Mediterranean compare in length with Lake Superior? It will be remembered that our Great Lakes produce a marked influence on the climate of the neighboring land, moderating

the heat of summer and the cold of winter. It is this influence, added to that of the mountain barrier, that gives to southern Italy, Greece, France, and Spain such an equable and almost tropical climate. How must these seas influence the rainfall?

PEOPLE

Their Origin. — It is generally believed that the white races now living in Europe belonged at one time — long before there was any written history — to one great family (p. 74). It is further believed by some that their original home was in Asia, by others that it was in northern Africa. However that may be, at the earliest time about which we have definite information, most parts of Europe were inhabited by uncivilized tribes having many different languages and customs. But the more advanced inhabitants of Egypt and southern and eastern Asia had already begun to exert a strong influence upon those Europeans who dwelt nearest them along the Mediterranean shores.

The Greeks. — Among the latter the Greeks took the lead. Their warm climate was favorable to many kinds of vegetation, and still not so hot as to destroy the energy of the people. Good harbors were numerous; the sea was so narrow that it could be crossed with safety; and thus navigation developed. Not only were the valuable treasures of neighboring shores brought in ships, but much trade was also carried on with the Far East by means of caravans that crossed the intervening deserts.

In time the Greeks even surpassed their teachers, the Asiatics, and became the most highly civilized people of the world. The writings of the ancient Greek philosophers, and the works of art produced by their sculptors, are to this day classed among the most wonderful of man's

works. They also founded the first republics, or governments by the people, of which we have historic account. But the fact that Greece is so mountainous, with many enclosed valleys, was unfavorable to the development of a united, powerful nation; and the country was therefore divided into small and independent states. This weakness accounts in part for the fact that, before the time of Christ, the Greeks were conquered by their neighbors.

The Romans. — Their later conquerors, the Romans, lived in Italy, with ROME as their capital. The Romans possessed a remarkable power for organization, and grew into a great nation, not only subduing the tribes around them, but finally obtaining control of all the countries bordering the Mediterranean. They even waged victorious war far to the north and west, under the leadership of Julius Cæsar, and for hundreds of years the Rhine and Danube rivers marked the northern boundary of the Roman Empire.

Much of this territory was held by force and governed by rulers sent from Rome. You see on the map (Fig. 109) that the sources of these two rivers are close together in the Alps, and that they form an almost continuous line from the North to the Black Sea. While the Romans claimed all territory south of this border, wild, barbarous tribes possessed all upon the other side. Thus Europe was divided into parts, controlled by two very different classes of people.

On the one hand, there were the Romans, representing the dark Caucasian type (p. 75), the most powerful nation then on the earth, and highly civilized. They had excellent roads, luxurious homes, magnificent public buildings, and various kinds of amusement. Although for a long time they wor-

shipped heathen gods, and bitterly persecuted the Christians, a little more than three hundred years after the time of Christ their government adopted the Christian religion.

On the other hand, there were vast hordes of barbarians representing the fair type of Caucasians (p. 75) and mostly free from Roman rule. They were divided into many independent tribes, and had made little advance in the civilizing arts. But they learned much from the Romans, adopted many of their best customs, and, in time, even accepted the Christian religion. The history of Europe, the customs of its people, and the very language of many of its nations, have all been profoundly influenced by the Romans. The descendants of these barbarians now form the powerful nations of northern Europe; and since those who settled Canada and the United States came largely from these nations, we ourselves are descendants of the barbarians of northern Europe.

Decline of the Roman Empire. — In time the Roman Empire began to decay. The great wealth that the higher classes had accumulated allowed them to live in the most luxurious fashion; and, being surrounded by hosts of slaves, — enemies captured in war, — they were unfortunately deprived of the necessity for work. In consequence the Romans gradually lost the ability and energy to defend their own country.

Their barbarian neighbors, on the other hand, were increasing in power. They were a hardy, energetic people, and they knew how to apply the many lessons learned from the Romans. The time came when they ceased to fear their once powerful foes. Then one body after another marched into the Roman territory as conquerors, finally sacking the city of Rome in the year 410. At the same time the distant parts of the Empire threw off the Roman yoke, and thus the Roman Empire crumbled and fell.

Later Development of European Nations. — Thus we see that, while the Roman Empire was at one time far-reaching, it did not succeed in binding its various peoples closely together, as one great nation with common interests. Nor have their descendants been brought together since that time. One of the most important reasons for this failure is the fact that so many parts of the continent are quite detached from all others. Spain, for example, is not only a peninsula, but it is separated from France by a high range of mountains. The British Isles are entirely cut off by water; Scandinavia nearly so; and Italy itself is bounded on the north by lofty mountains, and by water on all other sides. It is natural that people living in such isolated positions should not feel a common interest with those who are so separated from them. Thus have arisen many different customs, beliefs, and languages.

In consequence of such differences and lack of common interests there are many more nations in Europe than in North America. Count them (Fig. 172). There have been many jealousies and disputes between them which have been settled by war, and their boundaries have been subjected to numerous changes, as one nation or another has seized territory during war. Notice also how irregular are some of the boundary lines. Those of Germany, for example, have been determined only after the loss of tens of thousands of human lives.

People who carry on frequent wars and still thrive must possess an enormous amount of energy, and this is true of the inhabitants of Europe. After the fall of Rome little progress was made for a thousand years, and men were fighting in one part of Europe or another during most of that period. After this time, known as the "Dark

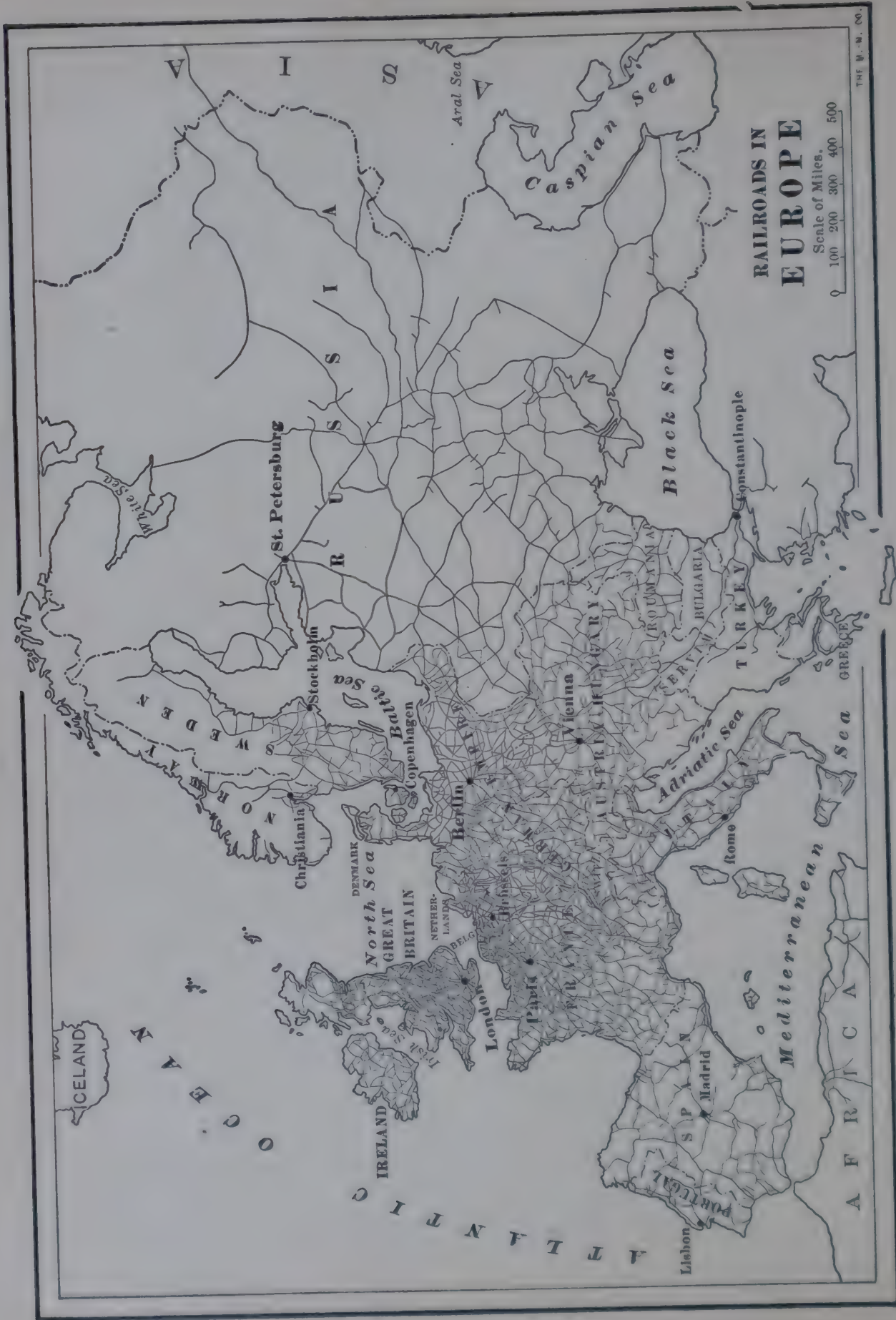


FIG. 119.

Judging from the number of railways, which parts of Europe are best developed? Which least? Name the leading railway centres.

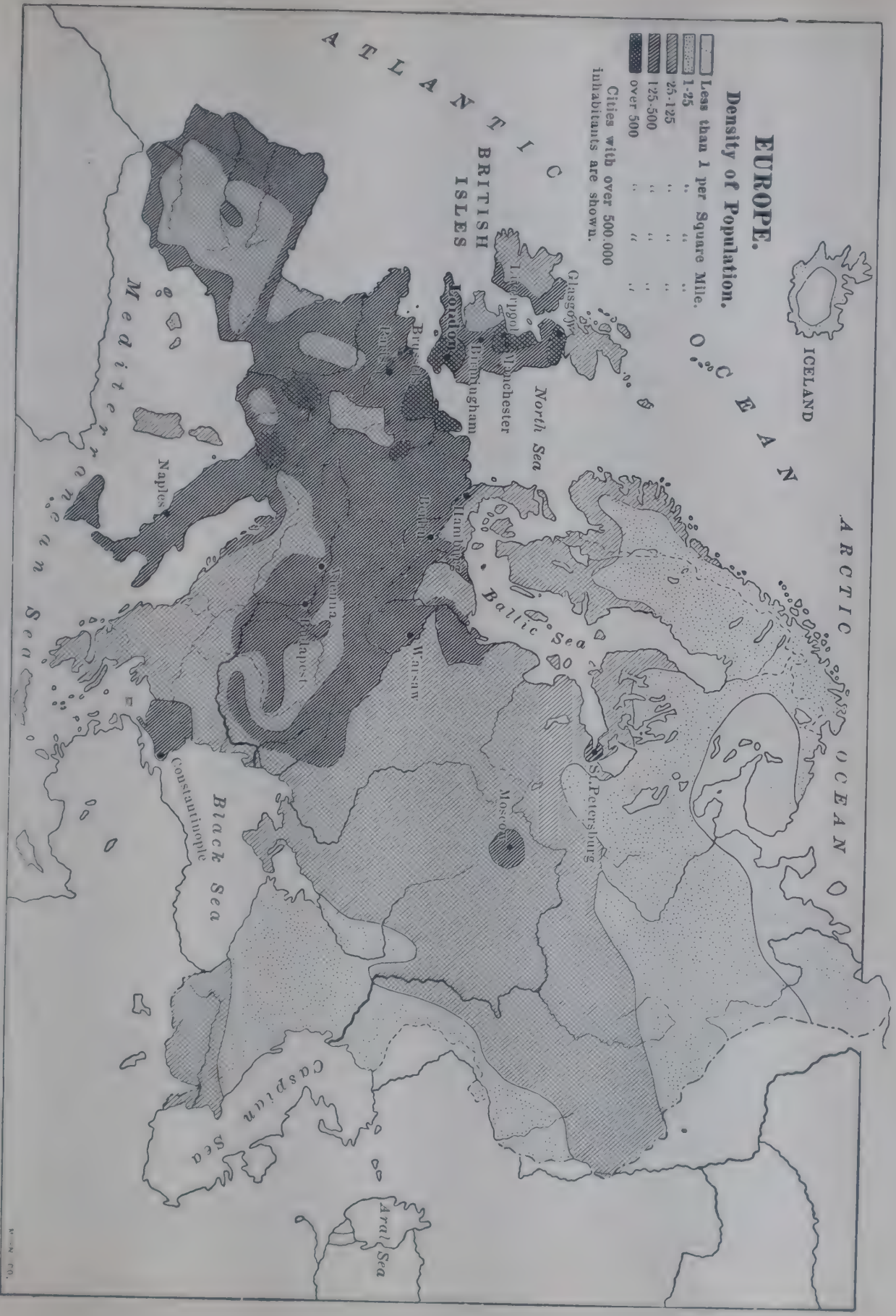


FIG. 120.

What correspondence do you observe between the most densely settled parts and the regions of most numerous railways? (Fig. 119). What reasons can you suggest for the fact that certain parts (like central Spain, northern Russia and Scandinavia, and the country between the Black and (Caspian seas) are not densely populated?



FIG. 121.

Some of the few wild animals of Europe. Domestic animals are abundant, including the reindeer of the tundras. Even the bear is tamed and exhibited. Have you ever seen one of these European bears performing on the street?

Ages," the people roused themselves for other work. They began to explore the world and to make inventions; and then our modern civilization began to develop.

Influence of the Discovery of America. — Of their many great achievements within modern times, probably the greatest was the discovery of America. In thinking of this event we are apt to consider only the mighty influence Europe has had on America. But the New World has also exerted a powerful influence upon Europe. The encouragement given to navigation by this discovery led Europeans to explore other parts of the world. Their knowledge was thereby greatly increased and their wealth as well. Also, the crowded condition of Europe has been much relieved; for many nations have poured forth emigrants, not only to North and South America, but also to Australia and Africa and, more recently, even to Asia. It is a peculiar tie that binds the newly settled countries to Europe; for, inasmuch as that continent has furnished most of the civilized population to these newer lands, it may be considered the *Fatherland* of them all.

REVIEW QUESTIONS. (1) Give reasons for and against treating Europe as a separate continent. (2) Tell about the highlands. (3) The lowlands. (4) The coal beds. (5) The Ice Age. (6) Locate the boundary of the ice sheet on Figure 114. (7) Tell about the coast line in northern Europe. (8) In southern Europe. (9) Of what advantage is the irregularity of the European coast? (10) Give the latitude of northern and of southern Europe. (11) How about its vegetation? (12) Its population? (13) Tell about the winds and rainfall of western North America. (14) Remembering its latitude, explain the mild climate of Europe. (15) How are its regular westerlies interfered with? (16) How is the east and west direction of its mountain ranges of great importance? (17) What is the influence of its inland seas? (18) Tell about the inhabitants of Europe in early times. (19) Which country took the lead in making progress,

and why? (20) Tell about the Greeks. (21) About the Romans and the extent of their territory. (22) Compare them with their barbarian neighbors in appearance and manner of life. (23) Why are these barbarians of especial interest to us? (24) Tell about the decline of the Roman Empire. (25) Give some reasons why Europe is divided into so many nations. (26) How has the discovery of the New World proved of great benefit to Europe? (27) In what respect is Europe the Fatherland of other countries?

CORRELATION WITH NORTH AMERICA. (1) Compare Europe with North America in regard to highlands. (2) To lowlands. (3) Distribution of coal beds.¹ (4) Extent of ice covering. (5) Irregularity of coast lines. (6) Latitude. (7) Vegetation (see also pp. 59 and 61). (8) Population. (9) In what respects are the two continents alike in climate? (10) In what respects unlike? (11) Compare the number of degrees of longitude in Europe with the number in North America. (12) Are the cyclonic storms as much needed in Europe as in America? Why? (13) Why should the most densely populated part of Europe be on the western side, while the most densely populated part of North America is on the eastern side?

SUGGESTIONS. (1) What results might follow if the mountains of Europe extended north and south near the western coast? (2) What disadvantages do some of the European countries suffer in consequence of the east and west direction of the mountains on their south? (3) Mention some of the results if the land should rise near Gibraltar, changing the Mediterranean to a closed sea. How would the British Isles be influenced? Also Italy? (4) In Figures 116 and 117 trace some of the isotherms across Europe and explain the causes of their irregularity. (5) In what section would you expect to find most wild animals? (Fig. 121). (6) Give reasons why some European countries, such as Germany, take much better care of their forests than Americans do. (7) Can you tell about any of the great wars and great generals of Germany, England, or France? (8) Can you tell of any of the changes in boundary lines; for example, in Poland, or between France and Germany? (9) Explain how the adoption of Christianity by the Roman government was an event of great importance. (10) What distinguished Greeks and Romans can you name?

¹ Some of these comparisons will be made easier by examining the figures in Section XXIV.

X. THE BRITISH ISLES

MAP QUESTIONS (Fig. 122). (1) Walk toward the British Isles. (2) What two large islands do they include? (3) What waters separate these two? (4) Name the three divisions of Great Britain. (5) Where are the Orkney Islands? (6) The Hebrides? (7) The Shetland Islands? (8) Find the Channel Islands. They are included among the British Isles. (9) What sea lies east of Great Britain? (10) What country of Europe is nearest to Great Britain? (Fig. 172). (11) What waters separate the two? (12) Make a sketch map of the British Isles. (13) Compare the coast line with that of Spain (Fig. 154). With that of Norway (Fig. 172). What suggestion do you get from this comparison? (14) Notice how many of the large cities of Great Britain are on or near the coal fields (Fig. 131). Why is this so?

Inhabitants. — When Cæsar invaded Britain in 55 B.C., he found the island inhabited by barbarians whose ancestors had crossed over from the continent. For the next four centuries the Romans governed Britain, introducing Christianity, building many excellent roads, and erecting strong walls in the north for protection against the inroads of wild tribes beyond.

After the downfall of the Roman Empire, invaders from the mainland continued to visit the British coast, either to plunder the natives or to make permanent settlements. Among these invaders were the *Angles* and *Saxons*, from whom the names *English* and *Anglo-Saxon* have been derived.

The Northmen from Scandinavia also raided the coast; and the Danes from Denmark at one time ruled a large part of England. Since the natives had no well-organized government,

they were unable to resist these inroads by water; but those who lived in the interior, or among the mountains, or on the more distant island of Ireland, were less open to attack. For this reason the Irish, the Welsh, and the Scotch Highlanders were less influenced by the invaders than inhabitants of what we now call England.

The Normans from Normandy in France, themselves descendants of the piratical Scandinavian vikings, entered England as conquerors in 1066.



FIG. 123.

Ancient cottage near the Lakes of Killarney in Ireland.

For a long time after that there existed three kingdoms, England, Scotland, and Ireland; but Scotland and England were united in 1603, and Ireland was added

in 1801. Thus a United Kingdom of Great Britain and Ireland was formed, and the name *United Kingdom* is now commonly applied to these islands.

From this brief history it is plain that the inhabitants have descended from several different peoples, and that their language and customs have been influenced by each. As a result of their surroundings and history the British people have developed a forcefulness which in large part explains the wonderful advancement of the empire.

Position, Size, and Importance. — London is fully seven hundred miles farther north than New York City, and the

British Isles are in the same latitude as Labrador. England itself is smaller than New England; and the British Isles, including England, Wales, Scotland, Ireland, and several hundred small islands, are not much larger than the state of Colorado.

Yet in spite of their northern position and small area, the largest city in the world is located in the British Isles. More than that, Great Britain has more manufacturing, after the United States, more foreign trade, a greater number of vessels upon the sea, and more colonies (Fig. 142) than any other nation in

existence (Fig. 193). There are of course reasons for these remarkable facts, and we shall next look for them.

Physiography and Climate. — The southwesterly winds from over the warm ocean (p. 161) offer a partial explanation of the above facts. Two days out of three these winds blow across the British Isles; and, since they have

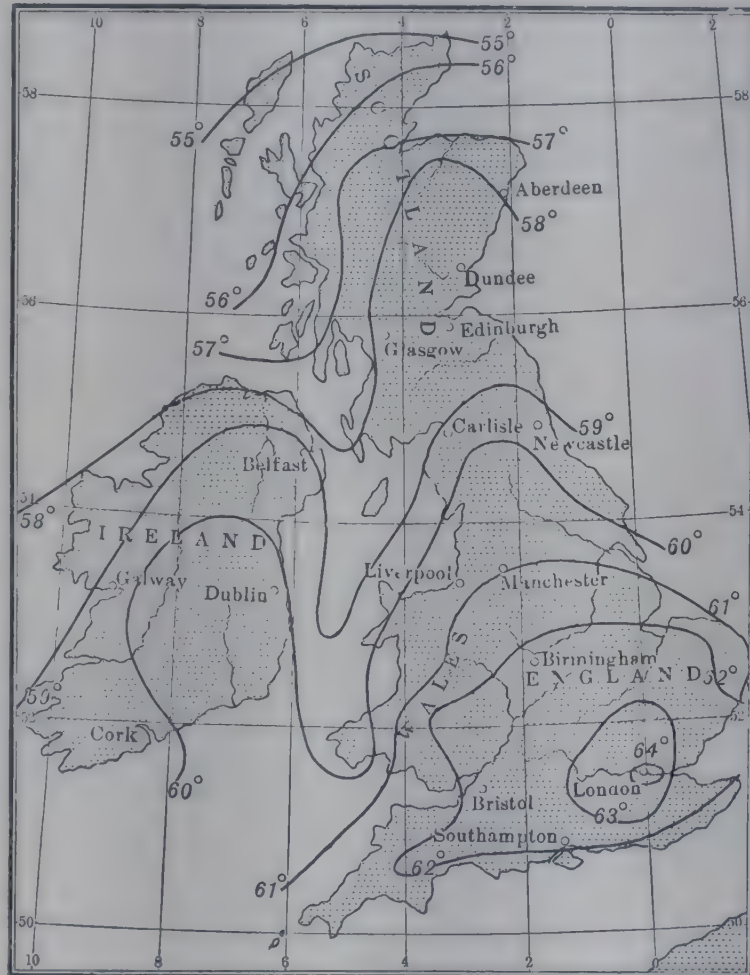


FIG. 124.

July isotherms for the British Isles.

traversed a vast expanse of warm water, they greatly temper the climate. Indeed, the winter season (Fig. 125) is milder than that in northern United States, and the summer (Fig. 124) is cooler (Figs. 36 and 37). The latter fact is due

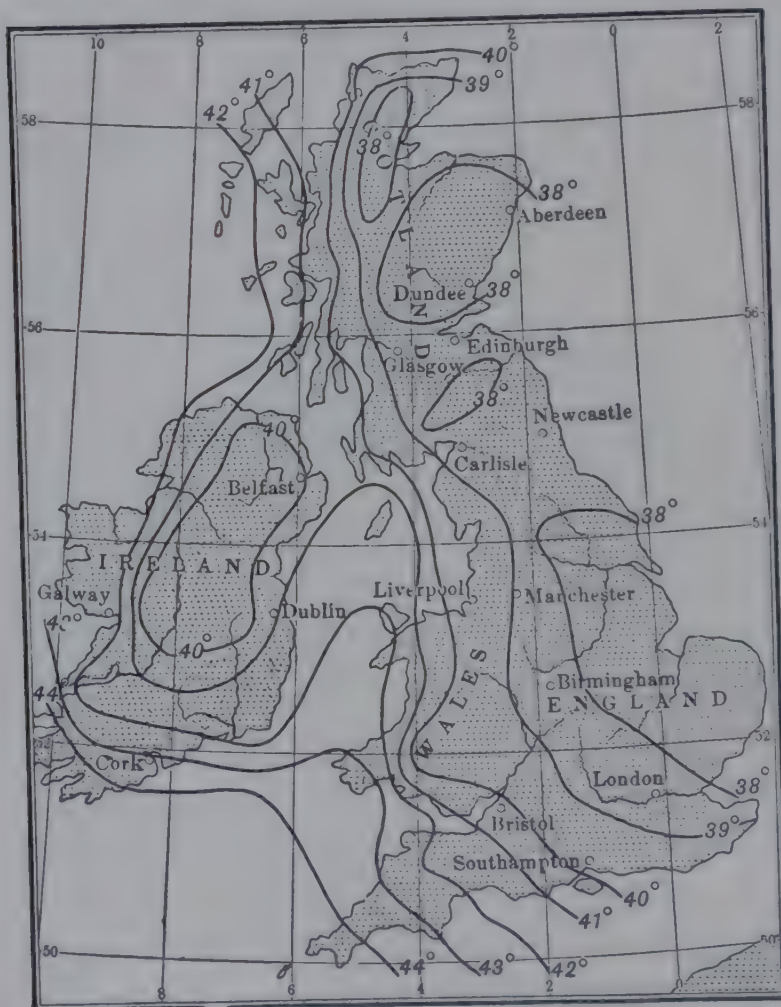


FIG. 125.

January isotherms for the British Isles.

The prevailing westerlies, carrying an abundance of moisture (p. 161), so distribute it over the islands that no section suffers from drought. Yet the western portions receive more rain than the eastern because the ocean winds visit them first (Fig. 126).

The highlands also influence the rainfall. A highland rim

partly to the low inclination of the sun's rays in these northern latitudes, and partly to the fact that the ocean water, though warm, is cooler than land warmed by a summer sun. Thus a temperature is caused which favors active exertion throughout the year, the summer days being rarely hot, the winter rarely excessively cold.

The prevailing

extends around Ireland (Fig. 122), giving to the surface of that island the form of a shallow plate. How does that influence the rainfall? (Fig. 126). Highlands are also found in Wales, western England, and most of Scotland (Fig. 122). Examine Figure 126 to see where the rainfall is heaviest in Great Britain. Where is the rainfall lightest? Why?

As already stated (p. 150), the mountains of Great Britain, like those of New England, are so old that they are worn very low. While this upland is rarely more than one or two thousand feet above sea-level,

there are occasional peaks of hard rock that rise to a greater height (Fig. 127). For example, the granite peak of Ben Nevis in Scotland, the highest point in the British Isles, is forty-three hundred feet in elevation. The Scot-

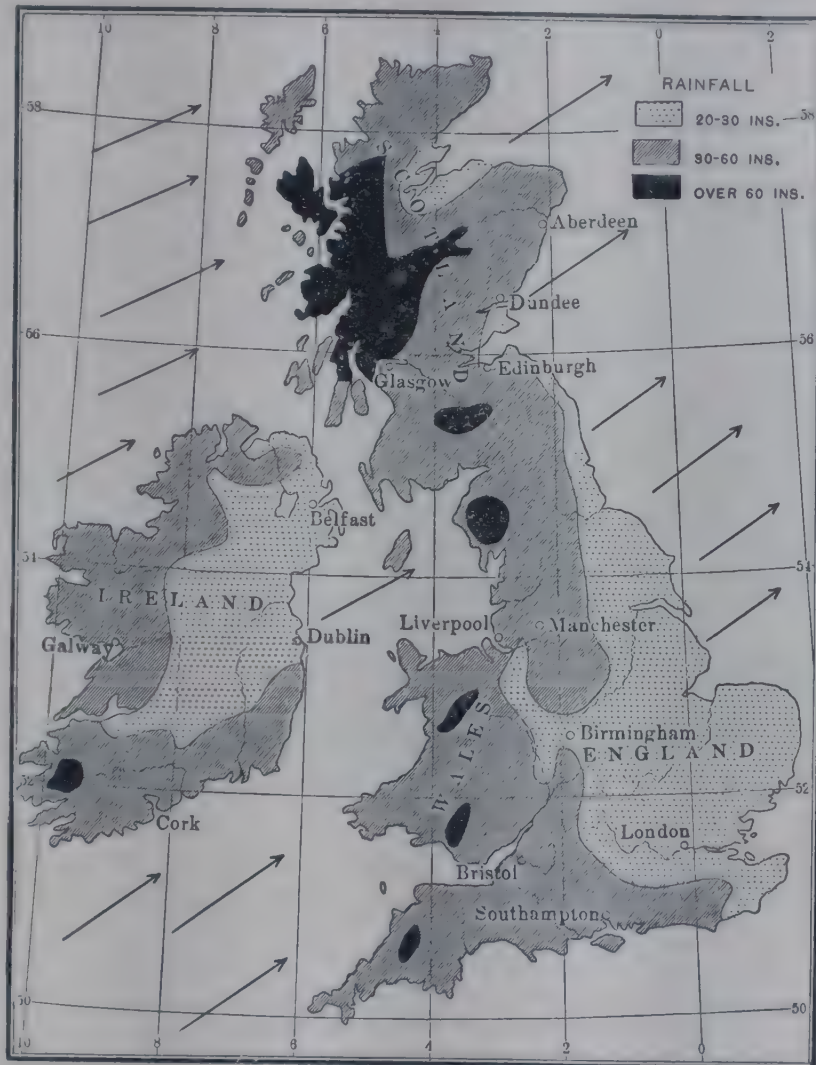


FIG. 126.

Rainfall map of the British Isles.

tish Highlands are so rugged and barren that few people are able to live there.

Where the rocks are softer and less disturbed by folding there are lower and more level tracts, or plains. Point out the broadest plains of Ireland, Scotland, and England (Fig. 122). Notice especially the narrow lowland of southern Scotland, near Edinburgh and Glas-



FIG. 127.

A view in the Highlands of Scotland.

gow. There the rocks are so much softer than those of the Highlands that instead of barren, hilly country, there is a fertile lowland, upon which, as in many parts of England, there are thriving industries.

What have you already learned (p. 154) about the Great Ice Age in the British Isles? As in northeastern North America, the glaciers had an important effect upon the soil and caused many lakes (Figs. 128 and 134). Explain how.

The coast line is very irregular, as can be seen from the map (Fig. 122). How does the coast compare with that

of New England? You have already learned that this irregularity is due to sinking of the land; and that the many islands are the crests of former hills, while the bays and harbors are submerged valleys. Since the mountainous western portion had more deep valleys for the sea to enter than the level plains of the east, there are more good harbors on the west coast than on the eastern side



FIG. 128.

The beautiful Loch Lomond in Scotland, a lake caused by the glacier.

of the islands. On both sides, however, the mouths of the larger rivers usually make good ports. Why?

Kinds of Industries. — In our study of the United States we saw that the people are mainly engaged in the seven great industries of lumbering, ranching, agriculture, fishing, mining, manufacturing, and commerce. The first two are almost wanting in the British Isles, but the others are extensively developed.

While it is true that in early times a large part of this land was densely wooded, little forest now remains, and lumber is consequently one of the leading imports. Since no portion of

the British Isles is arid, the ranching industry is not developed there as in western United States.

Agriculture. — In connection with agriculture, however, much live stock is raised. In fact, grazing has of late so increased in importance that there is now twice as much land in pasture as in crops, and the British Isles are noted



FIG. 129.

Pasture land in the Highlands of Scotland.

for their great number of fine cattle, sheep, and horses. The importance of grazing is partly explained by the fact that much of the surface, like that of New England, is too rocky or mountainous to be cultivated (Figs. 127 and 129). Besides this, some of the plains in eastern England, although too sterile for farming, make excellent pasture land. Two other facts favorable to stock raising are the mild winters, and the damp atmosphere which encourages the growth of grass. In addition to these

causes, the cheapness with which grain is raised in other countries, like the United States, and transported to the British Isles on the large steamships, has made it less necessary for the British to raise grain.

Owing to these conditions, there are more than thirty million sheep in the British Isles. The Cheviot variety, in southern Scotland, and the Southdowns, near London, are among the most noted kinds. Fine breeds of horses and cattle are raised on the more fertile lowlands, where the grass is long; for horses and cattle cannot eat as short grass as sheep can.

Several of the smaller islands are also widely known for live stock. For instance, the Shetlands are famous for Shetland ponies; and on the three Channel Islands, — Jersey, Guernsey, and Alderney, — near the French coast, three breeds of cattle have been developed which are well known in the United States. What conclusions can you draw in regard to the dairy business in the British Isles? Mention other uses of so much live stock. Would you expect to find a dense population in these grazing sections? (see Fig. 120). Why?

The cool summer climate, which is of advantage in some respects, is unfavorable to many kinds of farming; for example, it prevents the production of corn, cotton, tobacco, and grapes, which require warm summers. More hardy products, however, as oats, barley, and wheat, are extensively cultivated. Turnips, potatoes, beans, and peas are other important crops; also hops, which, together with barley, are used in the manufacture of beer. Owing to the many towns and cities, truck farming is of importance; and fruit and vegetable gardens are found near all the towns.

The demand for farm land has been so great that large areas of swamp have been reclaimed by careful drainage, and these now make the most fertile farms. But in spite of the care that has been given to cultivating the soil and to raising live stock,

far less food is produced than is needed by the inhabitants. Such vast multitudes are engaged in other occupations that if they were deprived of food from abroad, they would, it is said, begin to suffer from famine within a month. How different that is from our own country, whose area is so large, and climate so varied, that it not only supplies the food we need, but produces enormous quantities to be sent abroad.

Fishing. — Since the early inhabitants had to cross the sea



FIG. 130.

A cottage in southwestern England.

in order to reach these islands, and since most of their descendants have lived either on or near the coast, it is natural that, as a people, they should become accustomed to a seafaring life. This sort of life has also been encouraged by the fact that food fish abound on the shallow banks of the North Sea and of the ocean to the north and west of the islands. More than one hundred thousand men and twenty-five thousand boats from the British Isles are employed in the fishing industry. Among the fish caught are cod, haddock, and herring, as off the coast of New England and Newfoundland. Another important kind is a flat-fish, the sole, which resembles the flounder of the

New England coast. Salmon enter the rivers of northern Great Britain, and oysters are found along the southern coast.

Many fishing hamlets are scattered along the shore; but the fishing industry here, as in New England, is becoming more and more centralized in the large towns, which possess the capital for large vessels and expensive fishing outfits. The chief centres of the trade, like Boston and Gloucester in Massachusetts, are LONDON, HULL, and GRIMSBY (Fig. 136, near Hull) in England, and ABERDEEN in Scotland.

Mining.—One of the resources of the British Isles which early attracted people from southern Europe was the tin in southwestern England. This metal is not mined in many parts of the world, but has always been in great demand; and even before the time of Cæsar, ships from the Mediterranean came to England to obtain tin for use in the manufacture of bronze. Small quantities of copper, lead, zinc, and even gold and silver ores have also been discovered in the British Isles, but at present there is almost no mining of these metals.

On the other hand, the abundance of two other minerals, coal and iron ore, reminds us of our own country. We have already learned that Pennsylvania is the most important of our states in coal production, bituminous coal being mined in the neighborhood of Pittsburg, and the anthracite or hard variety about Wilkes Barre and Scranton. But coal is mined in many other parts of the United States. Can you name some? This one small island of Great Britain, however, produces almost as much coal as all of our states together; and the United States and Great Britain are the leading coal-producing countries of the world.

Figure 131 shows the sections of Great Britain in which coal is found. While most of the coal is bituminous, that in South

Wales is mainly anthracite. Large numbers of miners in the United States are Welshmen who have come from that section.

Iron ore is also abundant and favorably located. You will remember that in the United States the Lake Superior district, now the leading iron-producing centre of the world, has no coal, and that its ore is transported to the coal

fields of Pennsylvania and other states to be smelted. But in Pennsylvania, coal, iron, and limestone are near together; and at Birmingham, Alabama, they occur in the same valley side by side, making this district the most favorable for iron smelting in the United States.

Parts of Great Britain possess the same advantage as Birmingham, Alabama,



FIG. 131.

A map showing the coal fields of the British Isles.

whose name, in fact, is derived from the close resemblance of conditions about it to those about Birmingham, England. None of the British iron ore is far from coal; and

in places the same shaft is used to bring both coal and iron to the surface. Limestone is also abundant and near at hand. What suggestions do these facts give concerning the development of manufactures and the location of large cities?

Besides these minerals, various building stones are extensively quarried, as granite in Scotland, and slate in northern



FIG. 132.

A castle in Wales, situated on one of the hills of hard rock.

Wales. Salt is also found; and there is clay of such excellent quality for earthenware that several towns have become noted for their potteries, as Trenton and Cincinnati have in the United States. The extent of the mining industry in the United Kingdom is indicated by the fact that more than half a million persons are employed there underground.

Reasons for Development of Manufacturing. — Considering the abundance of coal and iron ore on the one hand,

and of wool from the millions of sheep on the other, it is clear that Great Britain is able to manufacture extensively. Even in very early times the English were engaged in the weaving of woollen cloth. Later, owing to numerous wars and to the oppression from rulers on the continent, England became a refuge for oppressed industrial people from the mainland, so that such manufacturing rapidly increased.

As in New England, the hilly sections have abundant water power due to the glacier. This also favored manufacturing; and later, when steam was employed, the abundant stores of coal were of great importance. The use of steam has led to the building of many factories, and to the growth of manufacturing centres. Therefore, the making of cloth on hand looms at the homes of the weavers has been generally abandoned, although this form of manufacturing still lingers in parts of Ireland.

The peculiar energy and inventive genius of the British, which kept their machinery in advance of that used by other nations, must also be considered. For example, it was the Scotchman, James Watt, who invented the modern steam engine; and it was George Stephenson who invented the first locomotive. The very smallness of the country is another advantage; for no matter where a factory may be located, it is near the coal fields and within a few miles of a shipping point.

Woollen and Cotton Manufactures. — In the mountainous section of northern England, near both coal and wool, are hundreds of factories engaged in the manufacture of woollen cloth. The principal centre of this trade is LEEDS, which has the added advantage of water power. On the western side of this hilly region is BRADFORD

noted for its broadcloth and worsted goods ; and neighboring cities manufacture woollen yarn, hosiery, carpets, and blankets. The woollen industry extends northward into Scotland and southward to LEICESTER, whose surrounding plains produce a breed of sheep that yields a wool for worsted yarn.

From the spinning and weaving of wool it was easy to move to cotton manufacturing ; and on the western side of the northern mountains we find a great cotton-manufacturing industry. Dampness is one of the points in favor of that section, for in a dry air cotton is in danger of becoming too brittle to spin and weave easily. Another reason why this work is best developed on the west side of the island is the fact that it is nearer the United States, from which so much of the raw cotton comes.

The centre of the cotton manufacturing is MANCHESTER. What cities do you find located near by ? This portion of Great Britain, including southern Scotland and the two sides of the mountain range of northern England, is the seat of the greatest textile industry in the world. Can you name cities of New England which are likewise engaged in cotton and woollen manufacture ?

In spite of the enormous number of sheep in the British Isles, the manufacturing industry has so far outgrown the local supply of wool that millions of pounds must be imported every year. This condition resembles that of New England, where much of the wool is brought from Ohio and more western states, as well as from foreign countries. As to cotton, since the British climate will not permit its cultivation, it is necessary to import about two billion pounds a year to supply the mills. Although much cotton is now obtained from Egypt, India, and other parts of the British Empire, our Southern States still supply the greatest quantity.

Iron and Steel Manufacturing. — In early times iron ore was mined from swamps, or bogs, in England and smelted by means of charcoal, as bog iron ore was mined and smelted in New England during Colonial times. The value of coal in smelting was not discovered until the eighteenth century ; but since the discovery of this use of coal, a great iron and steel industry has grown up in Great Britain.

Doubtless you can name some of the cities of the United States which are engaged in iron and steel work. In what states are they situated? Some are near the coal fields; which are they? Have you named any in New England? There is no coal there. Do you recall the metal manufactories that are most prominent in New England, and the reasons for their development?

The cities in Great Britain that are most noted for iron and steel products are BIRMINGHAM and SHEFFIELD in England, and GLASGOW in Scotland. BIRMINGHAM manufactures jewellery, watches, firearms, bicycles, steam engines, etc. SHEFFIELD has for centuries been distinguished for cutlery, the existence of grindstone quarries in the neighborhood being a partial reason for this particular industry. Why? It also manufactures steel rails and armor plates for warships. GLASGOW, on the Clyde, is a centre for shipbuilding and for the manufacture of locomotives and machinery of various kinds.

In cities round about these places are similar works; and as in New England, many of those occupied with the textile industry also produce textile machinery and other iron and steel goods. The island is so small that coal and iron are cheaply shipped to various points; and on this account, manufacturing, though best developed near the coal fields, is not confined to these districts.

Thus we see that here, as in the United States, coal makes possible an enormous industrial development. But in spite of the forest of chimneys in England and southern Scotland, the output of coal is more than sufficient to meet the demands. The materials to be manufactured, however, are not sufficient; for all the cotton, much of the wool, and part of the iron ore must be imported.

These three industries, connected with cotton, wool, and iron, have made Great Britain one of the great work-



FIG. 133.

The Clyde, at Glasgow.

shops of the world. The most important is cotton manufacturing; iron ranks next, and wool is third.

Ireland. — Ireland forms a striking contrast to Great Britain in several respects. In the first place it is mainly a country of farms instead of manufactures. The mild climate and damp atmosphere insure excellent grass throughout the year, and about four-fifths of the farm land is in pasture. It follows, therefore, that great numbers of cattle, sheep, and horses are raised. As in Great

Britain, the principal grain is oats; but barley, wheat, potatoes, and turnips are also raised.

Again, unlike Great Britain, Ireland is very barren of minerals. Building stones, such as granite, marble, and sandstone, are found, but there is extremely little coal or iron. For that reason, whatever manufacturing has been developed is located chiefly on the eastern side, where



FIG. 134.

The famous lakes of Killarney in the hilly part of southwestern Ireland. They are formed where glacial drift has obstructed the drainage.

coal is easily obtained from England or Scotland. At one point the two islands are only thirteen miles apart.

The lack of coal for use in the homes is partly made up by the abundance of "turf" or peat. Owing to the deposits of glacial drift, which have obstructed the streams (Fig. 134), the level interior is so poorly drained that marshes or bogs occupy about one-twelfth of the entire surface of the island. The water in these bogs protects the swamp vegetation from decay, so that it accumulates, forming a sod, which, when dug up and dried, makes a fairly good fuel. It will be remembered that

similar deposits, in the larger swamps of the Coal Period, caused the coal beds which are now of so much value (p. 153).

While manufacturing is little developed, there is one kind that flourishes in Ireland; namely, the making of *linen*. The Irish linens, which take high rank in our country, are made from the inner bark of the flax plant. Flax is grown in various parts of the United States, but mainly for the sake of the seed, from which linseed oil is made for use in mixing paints and in making varnish. In Ireland, however, flax is raised chiefly for its fibre.

The damp climate of Ireland is favorable to the growth of flax, and the cheap labor makes possible the great amount of care required in preparing it for the manufacture of linen. The stem of flax is tall and slender, and a field of it presents somewhat the same appearance as a field of oats. Instead of being cut, like grain, it is pulled up and left lying upon the ground for some time, exposed to the dew and weather, so that the gummy substance, which holds the woody matter and fibre together, may decay. After the fibre has been separated from the woody core by machinery, it is split and combed out with a steel brush and thus made ready for spinning.

Travellers in northern Ireland in summer see field after field covered with flax, which is used chiefly in linen factories at BELFAST. The fibre is made into thread in much the same manner as cotton or wool, and this is then woven into napkins, tablecloths, etc. Name other articles made of linen.

Ireland forms a third contrast to Great Britain in regard to population. Not only is it far less densely peopled, but the number of inhabitants is decreasing. Partly because of the unfavorable laws imposed by England, the Irish have long been discontented with their lot; and since the disastrous potato famine in 1846, they have been abandoning the country. They have sought refuge chiefly in America, and since the above date, the number of inhabitants has been reduced from 8,000,000 to 5,000,000.

Location of Principal Cities. — The cities most distinguished for manufacturing have already been mentioned ; namely, LEEDS, BRADFORD, MANCHESTER, SHEFFIELD, BIRMINGHAM, and GLASGOW. What industries are developed in each ?

There are other large cities along the coast ; for so much manufacturing calls for an enormous import of raw mate-



FIG. 135.

Commerce on the Thames below London Bridge.

rials and food, as well as the export of manufactured goods. These cities must, therefore, be the gateways to and from the island. And since Great Britain lies rather far north, between Europe and the New World, these shipping points must be located on the eastern, western, and southern sides, at those points where the best harbors exist, and not far from the great industrial centres.



FIG. 136.
 The location of London and of Liverpool.

First among the coastal cities to be noted is LONDON, with BRISTOL opposite it on the west. Farther north is HULL, with LIVERPOOL on the opposite side; and in southern Scotland is EDINBURGH, near the coast, paired with GLASGOW on the west. On the south side the two most important ports are SOUTHAMPTON and PORTSMOUTH. What are the principal cities of Ireland? Steamships, railway lines, and canals connect the various



FIG. 137.

The British Museum at London.

cities, carrying immense quantities of freight. In Great Britain and Ireland there are nearly four thousand miles of canal and over twenty-one thousand miles of railway.

London. — This city, the largest in the world, is situated on the Thames River. The Thames, like many other British rivers, has a wide, deep mouth, owing to the sinking of the land, and London is located as far inland as high tide allows vessels to go, or fifty miles from the open sea. The advantage of this position lies in the fact

that it is in the interior of the island, yet has direct water communication with foreign countries.

Before the Roman occupation the site of London was a fortified camp, situated on a low hill surrounded by tidal marshes and mud flats. The Romans maintained a ferry at this point; and the building of the first London Bridge, over eight hundred years ago, gave the city a great start. Since



FIG. 138.
Windsor Castle.

that time it has grown until Greater London now covers an area of 690 square miles and includes fully 6,500,000 persons. How does that compare with the number in Scotland? Ireland? New York City?

As in all great cities, one of the principal industries is manufacturing, nearly all kinds of goods being made, as in New York, Chicago, and Philadelphia. But New York, we know, owes its greatness largely to the fact that it is the gateway to a vast productive interior, while almost

any point in England can be reached by rail from London in a few hours. Nevertheless, although Great Britain is small, its population is nearly one-half as great as that of the United States, and the port of London is the point of entrance for much of their food.

In fact, this is the greatest shipping point in the world. Its rows of piers extend twenty miles down the river, and its railways radiate in all directions (Fig. 136). However, the fact that London lacks coal and iron near at hand, places it at some disadvantage compared with Liverpool and Glasgow.

London is not so noted for its export of manufactured goods as some of the ports nearer the great manufacturing cities; but it is the chief centre for imports. For example, nearly all the tea and wine used in Great Britain enter London. The great warehouses are filled with goods from all climes, — as flour, sugar, meat, tobacco, hides, and cocoanuts, — and many thousands of men are employed in them. Among the interesting sights of London are the wine-cellars, which occupy many acres of space underground and, like a city, are divided up into streets and lighted by gas.

Besides being the capital of the British Empire (Fig. 142), which is the name applied to the United Kingdom and its dependencies, London is the centre for the publication of books and magazines, and is provided with noted picture galleries, libraries, museums, and many magnificent buildings. Its wealth and trade are so extensive that it has been the money centre of the world, though New York, the money centre of the United States, now rivals it. The leading bank, called the Bank of England, is the agent of the government in many of its business transactions and employs about a thousand persons.

Being a very old city, many of the London streets are narrow and crooked. Some of the principal streets are too narrow

for street cars, so that, unlike American cities, the people have to be transported mainly by omnibuses. One of the largest companies runs thirteen hundred buses, and employs five thousand men and fifteen thousand horses. However, an underground railway, which encircles the great city, running under houses and streets, carries an enormous number of passengers.

Near London are many places of interest. Just below the city, on the south side of the river, is the Greenwich observatory, from which meridians of longitude are numbered and time is regulated. A few miles up the river is Windsor Castle (Fig. 138), the palace of the sovereigns of the Empire. Find CAMBRIDGE and OXFORD (Fig. 136), the two leading university towns of Great Britain.

Other English Cities. — Southwest of London, on the coast, is SOUTHAMPTON, where ocean steamers from the United States often stop (Fig. 143), and where fast trains wait to convey passengers to the metropolis. Close to Southampton is PORTSMOUTH, which has a great navy yard.

Almost due west of London, at the mouth of the Severn River, is BRISTOL, which is engaged in the lumber trade and in the manufacture of tobacco and chocolate. It was formerly next to London in size, but Liverpool has now far outstripped it. Can you suggest some reason why? Just west of Bristol is CARDIFF in Wales, the chief point in Great Britain for the export of coal.

Knowing the occupation of the dense population in northern England, we can tell the principal exports of HULL and LIVERPOOL. What must they be? The former city naturally trades mainly with Europe, and the latter with the Americas and West Africa.

Before the discovery of the New World, the west side of Great Britain had little commerce, and LIVERPOOL

(Fig. 136), therefore, had little business or growth. But with the settlement of America the city grew until it now has an immense trade with North and South America, and is the third city in size in the United Kingdom. Many passengers from America land at this port and go

by rail to London. Besides its commerce, Liverpool is also important for its shipbuilding. What circumstances are favorable to that industry? A ship canal, about thirty-five miles in length, has recently been built to MANCHESTER, at an expense of \$75,000,000.

Cities of Scotland. — GLASGOW, on the western side of



FIG. 139.

The churchyard described in Gray's Elegy.

the lowland plain of southern Scotland, is not only a great manufacturing centre (p. 188), but it is also a leading shipping point for the same reasons that Liverpool is. State them. Fifty years ago the Clyde could be forded at this place ; but it has been deepened by dredging until

the largest vessels now enter (Fig. 133), and the population has so increased that the city is now next to London in size. What must be some of its principal imports and exports? • Why?

EDINBURGH, unlike the other great cities named, is neither a shipping point nor an important manufacturing centre. It is distinguished as the capital of Scotland, and one of the most beautiful cities of the British Isles. Its



FIG. 140.

Kenilworth Castle, described by Scott in "Kenilworth."

importance is historical rather than commercial; for in the early days it commanded the entrance to the lowland of southern Scotland. The well-known University of Edinburgh is situated here. LEITH, a short distance away, is the port for Edinburgh.

Farther north on the coast are the important ports of DUNDEE and ABERDEEN (p. 183). The former sends forth a number of Arctic whaling vessels each year, and is also engaged in the manufacture of linen and other textiles.

Cities of Ireland. — The principal cities of Ireland are

on the east and south sides. Why? What has already been said about BELFAST? (p. 191). It is also noted for its shipbuilding. DUBLIN, the capital and largest city, and the chief port for the English trade, ships farm and other products to England, and receives manufactured goods in return. QUEENSTOWN has a fine harbor, and is a stopping point for some of the vessels bound from America to Great Britain.

Scenery. — The number of places of interest and beauty in the British Isles is very great. This is of advantage, not

merely to the British, but also to the large number of tourists from other countries who visit the islands.



FIG. 141.

Shakespeare's house at Stratford-on-Avon. Since this picture was taken, the house has been somewhat changed in appearance.

One of the most attractive parts is the Lake District in northwestern England; another is the Killarney Lakes in Ireland (Fig. 134); and there is so much coast, and so much hilly country, that the variety

of views and of means of entertainment is very great. The fact that distances are so short that desirable points are readily reached, is important for the many who have little money, but need a restful vacation.

There are also many historic places which are visited by great numbers. Among these may be mentioned the home of

Shakespeare (Fig. 141); many cathedrals; and the ruins of castles, the ancient homes of noblemen (Figs. 132 and 140).

Fuller Reasons for the Greatness of the British Empire.—

While we have learned many facts about the British Isles, some important questions are not yet fully answered. For example, why does this little country possess more colonies (Fig. 142) than any other nation of the earth? Further, why should it have the greatest foreign trade? And why the greatest number of vessels upon the sea?

Some of the reasons in answer to these questions are as follows. The fact that Great Britain is so small—it is impossible to find a point more than seventy miles from the salt water—is a reason why many of the British have been sailors. It is not surprising, therefore, that they have produced many explorers, such as the Cabots who sailed from Bristol, Sir Francis Drake, and Sir Walter Raleigh. What parts of the world did they explore?

Nor is it to be wondered at that, as these explorers discovered new parts of the world, they laid claim to them in the name of their mother country. In this way, and by war, Great Britain came into possession of the Thirteen Colonies of North America, Canada, India, Australia, much of Africa, and many other places (Fig. 142). At present her territory includes about one-fifth of the land surface of the globe and one-fourth of its inhabitants.

These colonies and dependencies help to explain Great Britain's enormous foreign commerce; for the colonies have found it more advantageous to trade with the mother country than with other nations speaking a different language and having less understanding of them or sympathy with them. They sell to her their raw products, including food, and she in return sends to them clothing,

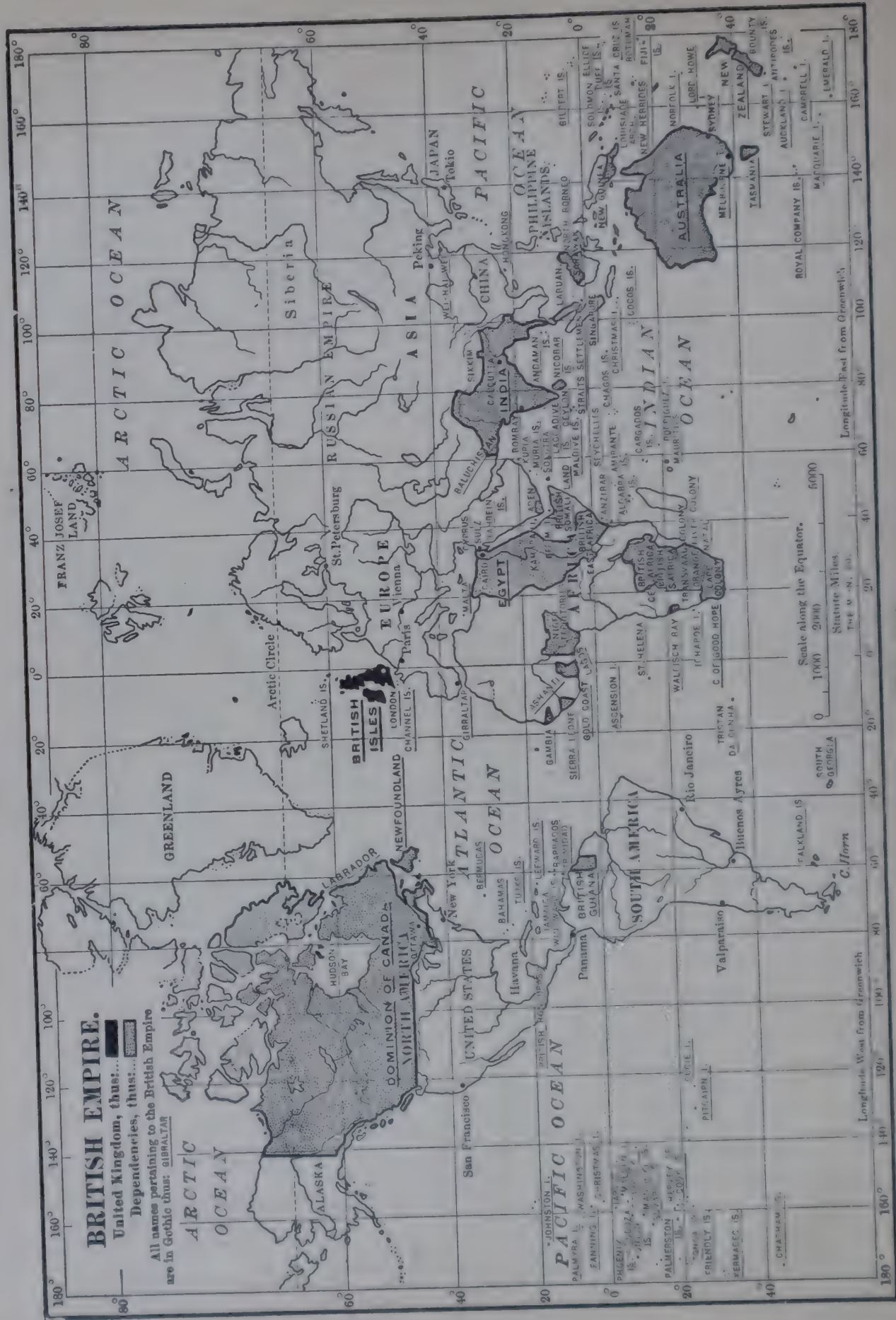


FIG. 142.

steel goods, and other manufactured articles. It is largely the exchange of goods with these colonies that has made the foreign trade of Great Britain nearly twice that of any other nation. Next to her colonies Great Britain's greatest trade is with the United States.

Some of the reasons why this little island should own more vessels than any other nation have already appeared. In fishing, exploring, and making settlements, a large

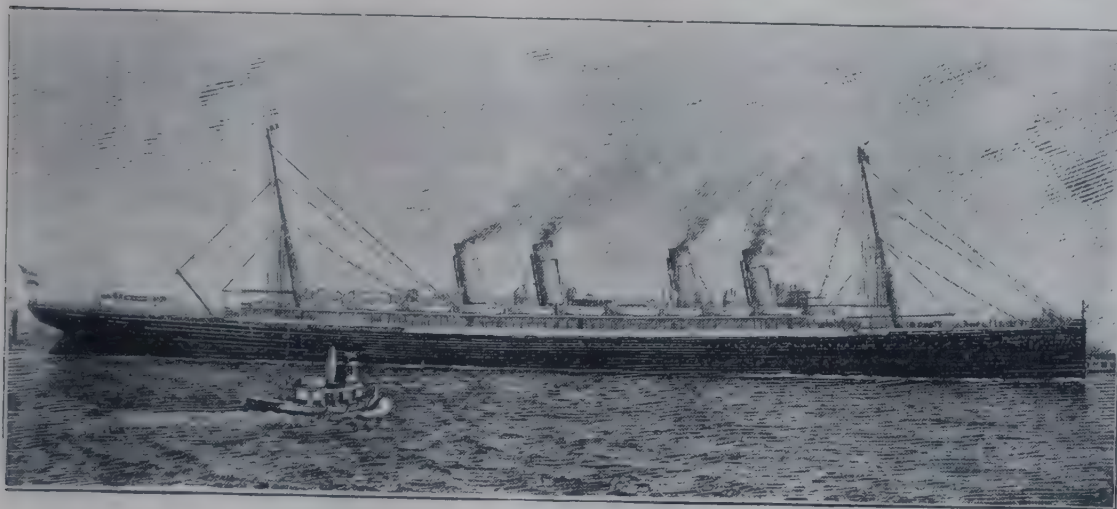


FIG. 143.

The *Kaiser Wilhelm der Grosse*, a German steamship which makes a stop at Southampton. It is one of the largest steamships, cost \$2,500,000, and consumes about 500 tons of coal a day. The crew numbers about 500.

number of ships have been needed; and for the proper defence of her widely distributed colonies many warships have been required. Another reason for so large a navy is the fact that the British Isles are cut off from all other nations by water. They must, therefore, rely rather upon warships for defence than upon a standing army.

Further than this, the British are actually forced to own many ships. Here are over forty million people living on two small islands, from whose soil it is impossible to obtain the necessary food. They must send ships

away for their flour, meat, sugar, coffee, etc.; and they must send abroad for much of their raw material for manufacture. Also in order to pay for the raw materials and food, their manufactured goods must be shipped to all parts of the world; otherwise their extensive manufacturing would be impossible.

These facts show why a very large number of vessels must be employed; and there are two reasons why the British, rather than other nations, should own them. In the first place, such trade is profitable. In the second place, when they own their own vessels they can send them where they will, and are, therefore, independent in case of war.

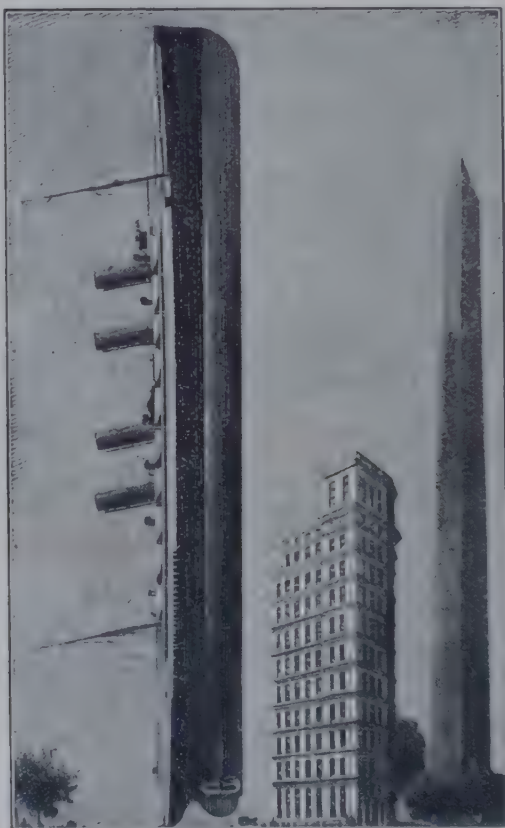


FIG. 144.

The same steamer as in Figure 143, to show its great size in comparison with a high building in New York City and with the Washington Monument (555 feet high). The length of this steamer is 648 feet, its width 66 and its depth 43 feet.

These facts, coupled with the remarkable energy of the British, are the principal reasons why the United Kingdom greatly surpasses all other nations in the number of her warships and merchant vessels. To illustrate the immense importance of the shipping interests of Great Britain it may be stated that every day in the year there are said to be fully a thousand ships entering her ports.

Few persons appreciate the magnitude of a single large steamship, or its carrying power and cost (Figs. 143 and 144). Measure off a distance out of

doors as long as the steamship in Figure 144. Compare it with the length of an ordinary freight car. This vessel is able to accommodate about two thousand persons besides the crew, and an enormous amount of freight in addition.

Government. — The government of the United Kingdom is a limited monarchy, the present ruler being King Edward VII. We know that in the United States our



FIG. 145.

The House of Parliament.

general laws are made at Washington by a Congress composed of a Senate and a House of Representatives. In the United Kingdom the law-making body corresponding to this is called *Parliament*. It is likewise composed of two bodies, the House of Lords and the House of Commons.

The *House of Lords* is made up of men with inherited titles who are not elected by the people. In former times the Lords were so powerful that the people had little control of the government; but for many generations their power has been restricted, and the *House of Commons*, whose members

are elected by popular vote, is now by far the more important. Through them the people are able to make their own laws, and the government is therefore one of great freedom.

While the sovereign is nominally the executive, like our President, the execution of laws is really in charge of a *Cabinet* composed of a *Prime Minister* and several other *Ministers*, who are responsible to the House of Commons for their actions. If the Ministers lose the support of the House, they are obliged to resign; and then others are appointed who will carry out the wishes of the people.

That this government is highly satisfactory is proved by the fact that there is little desire on the part of the many British colonies to sever their connection with the mother country. Undoubtedly either Canada or Australia could, if it chose, separate itself from the mother country. But the mutual protection which their union furnishes, and the advantages of trade which it offers, prohibit any serious thought of such action. Most of the British colonists, therefore, form a loyal part of the British Empire, always ready to support the government and proud of their citizenship.

REVIEW QUESTIONS. — (1) Relate the early history of the British Isles. (2) Give their location. Their area. (3) What noteworthy facts about their importance? (4) Tell about their climate. (5) Their physiography. (6) The effects of the ice sheet. (7) The coast line. (8) What two common industries are little developed in these islands? Why? (9) Why is so much of the land in grass? (10) Tell about the live stock. (11) What crops cannot be raised? Why? (12) What are the principal farm products? (13) What disadvantage do the people suffer in regard to food supply? (14) Give the principal facts about the fishing industry. (15) What metals are found in small quantities? (16) How about the abundance of coal and iron ore? (17) Locate the chief coal fields in Great Britain. (18) Name the sections of the United States that are noted for iron ore. (19) Tell about the iron ore in Great Britain. (20) Name other important mineral products. (21) Give reasons for the development of textile

manufacturing in Great Britain. (22) What cities are especially noted for the manufacture of woollen goods? (23) For cotton? (24) Tell about the manufacture of iron and steel goods. (25) What about the farm products of Ireland? What about minerals there? (26) About manufacturing? (27) What is used for fuel? (28) Tell about the linen industry of Ireland. (29) About the population. (30) Name and locate the cities in Great Britain that are distinguished for manufacturing. (31) Name and locate the principal coast cities. (32) Tell about London: its location, principal kinds of business, etc. (33) What noted palaces are near by? (34) Tell about each of the other cities mentioned. Locate each. (35) What can you say about the scenery of the British Isles? (36) Give some reasons why the British Isles have more colonies than any other country. (37) Why more foreign trade? (38) Why the greatest number of vessels? (39) Tell about their government.

SUGGESTIONS. — (1) On a sketch map of Great Britain mark the position of the highlands and lowlands. (2) Considering the prevailing winds, which side of the great cities must be most free from smoke? (3) Why are sheep able to eat shorter grass than cattle? (4) Make a list of goods made out of flax, and place samples in the school cabinet. (5) Write a paper telling in what ways the people of the British Isles and the United States depend on one another. (6) State ways in which New England and Great Britain resemble each other. (7) Talk with some Irishman to see how he feels toward England, and why. (8) What names of British cities have you met in your study of the United States? In what portions of the United States are they? (9) Collect pictures of scenes in the British Isles. (10) What books have you read which describe the scenery or the people of these islands? (11) Find out other facts about the large steamships. (12) What advantages do you see in the fact that the British Isles are near the continent, yet separated by water? (13) Read in George Eliot's "Silas Marner" for a description of old-fashioned manufacturing by hand looms. (14) Also in "John Halifax, Gentleman," for an account of the introduction of steam into the factories. (15) Read Gray's "Elegy Written in a Country Churchyard." (16) Read Scott's "Kenilworth." (17) Find out some facts about Queen Victoria.

XI. THE NETHERLANDS AND BELGIUM

MAP QUESTIONS (Fig. 154). — (1) Compare the area of the Netherlands with that of Belgium; with that of Great Britain. (2) Compare the coast lines of the Netherlands and Belgium. (3) What large river crosses the Netherlands? Through what countries does it pass? (4) What countries border the Netherlands? (5) Belgium? (6) Make an outline map of these two countries.

THE NETHERLANDS (HOLLAND)

Physiography. — Figure 146 shows the Netherlands to be a peculiar country. The greater portion is very low,

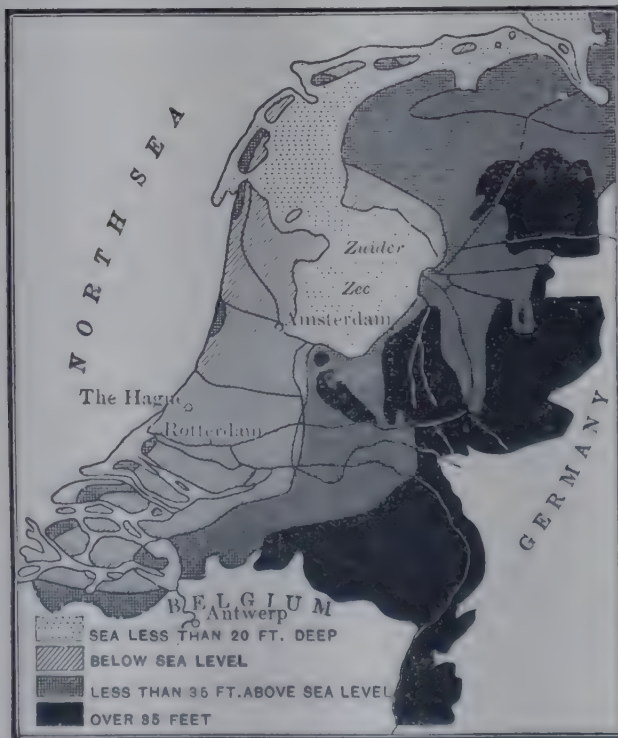


FIG. 146.

Map to show the portion of the Netherlands that is below sea level.

no doubt, all the way from the Alps. A large part of the country is, in fact, a delta of sand and clay built by the Rhine, and it

and some parts are as much as fifteen feet below sea level. In fact, if protection against sea and river were not provided, about one-half of the surface would be occasionally or permanently under water. This explains why the country, sometimes called Holland, is more commonly known as the *Netherlands*, a word meaning *low country*.

The Rhine has brought much of the soil, some of it, A large part of the country built by the Rhine, and it

is so low and level that over much of the surface the only notable elevations are either sand dunes, thrown up by the wind, or glacial moraines of sand and gravel. In Figure 114 notice how far the ice sheet reached in this section. Hard rocks are found only in the eastern and southeastern parts, where the highest point is a little over a thousand feet.

In so level a country there can be little water power; and little mineral wealth may be expected in the soft clays and sands. Some iron is found in the bogs, which are extensive, and a small amount of coal is mined in the extreme southeast. Under the circumstances, is there promise of much manufacturing?

Owing to all these disadvantages the Netherlands might seem to be incapable of supporting a large population. Nevertheless that country has about two-thirds as many inhabitants as the remarkably productive state of New York, which is four times as large.

People and Government. — Perhaps the leading explanation of this prosperity is the high character of the *Dutch* people, as the Netherlanders are called. For centuries they have felt an intense love for civil and religious liberty; but, being a small nation, they have suffered many hardships in attempting to establish independence and tolerant laws. At one time they were under German control; later they came under the cruel rule of Spain; but finally they obtained their independence, and their form of government is now a limited monarchy.

While their belief in freedom brought them untold suffering, it was a cause of progress as well. It was to Holland that the Pilgrims first fled when religious persecutions drove them from England; and from time to time large numbers of Huguenots, Germans, and others found refuge there. These

immigrants, who were persecuted and driven from home because of their advanced ideas, have nearly always been among the most enlightened people of Europe. Their settlement in the Netherlands therefore had a great influence on the intelligence with which Dutch industries were developed.

Agriculture. — Agriculture, including grazing, is the principal industry of the kingdom, although, largely on account of swamps and sand dunes, a fifth of its area is waste land. The principal farm products are grains, such



FIG. 147.

A farm scene on the plains of Holland.

as rye, oats, wheat, barley, and buckwheat; also potatoes, sugar beets, beans, peas, and flax. More land is devoted to pasturage (Fig. 147) than to these crops, partly because much of the higher land is too sandy for cultivation, and partly because the moisture in the lowlands aids in the growth of excellent grass (Fig. 147). Cattle, hogs, sheep, and horses are raised in great numbers; and quantities of butter and cheese are made.

Reclaimed Land. — There is, of course, good reason why the Dutch have been willing to endure the labor and danger in-

volved in reclaiming large tracts of land from the sea. As the population increased, and the need of new farm land grew, it was found possible to keep the high tides and rivers from overflowing the salt marshes and flood plains. In this way the people have added large areas of fertile land, and have also been encouraged to undertake the even more difficult task of reclaiming the shallow sea bottom.

Such drainage began in the twelfth century and has continued until the present day. It has already about doubled the area of the Netherlands, and now a scheme is under way to reclaim the Zuider Zee itself (Fig. 146).

The first step in reclaiming a section of land is to build dikes or embankments around it. Then the water is pumped from the enclosure and emptied into the rivers or the sea. Windmills were formerly employed for pumping, and many are still in use (Fig. 147); but more recently steam pumps have been introduced. And since they run all the time, while windmills work only when the wind blows, the use of steam has made it possible to drain areas which could not have been kept dry by windmills alone. It has sometimes required years, after the dikes were finished, to pump all the water out of a portion of land prepared for drainage. Even then pumping must be continued in order to keep out the water which falls as rain and that which soaks through the soil.

The ditches for draining the land really form canals, which, by means of their embankments, enclose houses, gardens, and fields, much as fences or stone walls enclose houses and gardens in other countries. They are so numerous that they extend over the lowlands in a great network.

On the coast the sea is kept out partly by sand dunes. There are also sixteen hundred miles of sea dikes for this purpose, besides many smaller dikes which prevent the rivers from overflowing the lowlands. Since the sea dikes must be very strong, stone is often brought from foreign countries to be used in their construction. They are sometimes fully three hundred feet thick and thirty feet high. Some idea of the resistance that they must offer is gained by standing behind

them at high tide and listening to the beating of the waves against the opposite side, perhaps ten feet above one's head.

Manufacturing. — Although there is very little coal or water power in the kingdom, there is an abundance of



FIG. 148.

A Dutch windmill.

coal near by in Belgium and Germany. It is also not far to the great coal fields of England. Estimate the distance (Fig. 154). Accordingly, since the people require quantities of cloth, shoes, machinery, etc., they import coal and many of the necessary raw materials and

manufacture for themselves. The strangers who fled to the Netherlands to escape persecution did much toward developing early manufacturing, and this industry now ranks next in importance to agriculture.

The growth of manufacturing has also been aided by the efforts of the Dutch to reclaim land from the sea. The windmills, with their enclosing buildings, were valuable not merely as houses, storehouses, and pumps, but also for the purpose of grinding grain. Thus, lacking waterpower, the Dutch learned

to make use of *wind power* to some extent. Again, in order to build their canals and dikes, and to drain the land, they needed implements, such as ploughs and pile drivers, and these they manufactured. Also, having an abundance of clay, and needing both bricks and tile in their drainage work, they developed manufacturing in these directions. Necessity is an excellent teacher, and the Dutch have had ample opportunity to take lessons from her.

Commerce. — Commerce is highly developed for several reasons. In the first place, the ditches, built primarily for purpose of drainage, are also valuable as canals; and these, together with the rivers, make transportation by water very easy, to all sections of the country. The flat-topped dikes also make excellent wagon roads; and the level nature of the land renders the construction of tramways and railways a simple matter. Many of the railways connect directly with the European trunk lines.

In the second place, the *position of Holland* gives her a distinct commercial advantage. The Netherlands lie directly in the path of entrance to northern Europe, and the country is crossed by the Rhine River, which is navigable for a long distance into Germany. Therefore much of the American and British trade with central Europe is carried on through Holland.

Colonies. — The Dutch colonies (Fig. 193) furnish a third reason for an extensive development of commerce. Since the very earliest times the Dutch have been in close contact with the salt water. Not only have they battled with the sea in reclaiming land, but to visit some of their near neighbors they have been obliged to cross it. Moreover, both the Zuider Zee and the North Sea, near at hand, contain many food fish; and this fact has led to an

important development of the fisheries, one of the leading industries of the country. The men have therefore become expert sailors ; and when discoveries of new lands were being made, the Dutch sailors naturally shared in the explorations and obtained colonies.



F.G. 149.

A canal in Amsterdam. Notice the peculiar fronts of the Dutch houses.

The attempt of the Dutch to colonize our Hudson valley was thwarted by the English ; but Holland retains possession of other important regions. Of these, Dutch Guiana in South America has already been mentioned (p. 126) ; but the most important are Java and several other East India islands. The manufacture of raw products from the colonies constitutes one of the principal industries of the coast cities.

The possession of these colonies, Holland's position, her water and rail connections with other countries, and her many canals and excellent roads make the transportation of goods an important industry.

Cities. — AMSTERDAM and ROTTERDAM are the two principal commercial centres. The former, the largest city in the Netherlands, is about the size of Baltimore. It is connected with the ocean by canal, and is noted for its university and museums, as well as its shipping, manufacturing, and diamond cutting. The dia-



FIG. 150.

A canal in the city of Rotterdam.

monds are brought in the rough from the great diamond fields of South Africa, where the Dutch were formerly in control, and at Amsterdam they are cut and polished ready for setting.

The rulers of Holland are crowned at Amsterdam, the capital, although the royal family lives at THE HAGUE where the government buildings are situated. Because of the sea breezes, and the excellent bathing in the shallow water on the long sandy beach near by, The Hague is also noted as a summer resort.

ROTTERDAM (Fig. 150), next to Amsterdam in size, is the great seaport of the Netherlands. Its location near the mouth of the Rhine makes it one of the principal ports for the interior of the continent, and explains why it is the European terminus for some of the great steamship lines from New York and other parts of the world.

BELGIUM

Physiography. — The surface of Belgium forcibly recalls that of Holland. The land is low and flat in the northern and western parts, and gradually rises and grows more rolling toward the south and east.

However, the highest point in Belgium (2230 feet) is more than twice that in the Netherlands. Instead of being caused by glacial moraines and sand dunes, this highland is a mountainous region, formed by upheaval of the earth's crust (Fig. 151). The weathering of ages, which has worn these mountains so low, has revealed valuable mineral deposits, especially coal and iron, which fortunately occur near together, as in England. Lead, zinc, and silver are also obtained.

Belgium, therefore, possesses agricultural advantages similar to those of Holland, while the minerals secure opportunities for manufacturing far superior to those of the Dutch. These facts help to explain why, although Belgium is even smaller than Holland, its population is one-fourth larger, or about 6,500,000. How does that compare with the population of New York state? Indeed, the small country of Belgium is one of the most densely populated regions on the earth. Figure out the number of inhabitants per square mile and compare it with the number in New York, or in your own state.

People and Government. — Like the Dutch, the Belgians have endured untold sufferings in their long struggle for independence. Their country has been, to some extent, a battlefield for the larger countries or *powers* of Europe; for example, the *battle of Waterloo*, by which the career of Napoleon Bonaparte was ended, was fought

there in 1815. Since 1830, however, the Belgians have been independent. Their form of government is a limited monarchy.



FIG. 151.

A view in the hilly section of southern Belgium.

The intelligence of the Belgians is of the highest order. Even during the Middle Ages their woollen manufactures were the best developed in Europe, and at various times the kings of England have induced Belgian artisans to move to England for the purpose of improving the factory work. Since the great nations of Europe have declared Belgium neutral territory, thus prohibiting further fighting there, the people have found it necessary to keep only a small standing army, and have devoted themselves to the industries. As a result, Belgium has enjoyed a wonderful industrial growth.

Agriculture. — A very small part of Belgium is below sea level ; but, as in the Netherlands, much of the country

is so flat and fertile that a view on the Belgian plain would closely resemble that in Figure 147. More than



FIG. 152.

A dog team in Belgium.

half the inhabitants are engaged in agriculture, the chief products, besides live stock, being grain, flax, hemp, fruit, and sugar beets. Among the farm animals, the Flemish¹ horses are especially noted for their great size and strength.

The Belgian method of farming forms a striking contrast to that in the United States; for, instead of ranging from one

hundred to several thousand acres, farms in Belgium usually contain not more than two or three acres. To a large extent, spading takes the place of ploughing, and such hand labor, guided by the experience of many generations, secures large yields of the best quality. Flemish flax is the best in the world. In spite of such careful cultivation of the soil much food has to be imported, as in Great Britain.

Mining and Manufacturing. — Quite distinct from the level northern plain, close set with farms and towns, is the hilly region of the southern angle (Fig. 154), covered with forests and rich in minerals. More than one hundred thousand men are engaged in mining, and coal and coke

¹ Derived from *Flanders*, a former country of Europe which included a part of the Netherlands, Belgium, and France. Nearly half the Belgians speak the Flemish language.

are among the leading exports. Around the northwest slope of the hilly region is located one of the world's busiest industrial regions. As in England, there are three important kinds of manufacturing, namely cotton, wool, and iron and steel. Linen and glass are also made. But the country is so small, and there are so many waterways and railways,—as in the Netherlands,—that coal is transported cheaply to all sections. Manufacturing, therefore, is well distributed, although the coal comes from the southern portion.

Commerce. — By its position Belgium secures many of the advantages that Holland enjoys; that is, it is a gateway to and from the interior of Europe. To be sure, its coast line is only about forty miles in length and the water there is shallow; but ANTWERP has an excellent harbor. There is no large river like the Rhine in Holland, but two smaller streams, rising in France, are navigable for some distance. There is also an extensive system of canals. Besides these waterways, Belgium has more miles of railway, for its size, than any other country in Europe; and the railways are closely connected with the large trunk lines. For these reasons transportation of goods is one of the leading industries in Belgium.

While the Belgians do not possess such valuable colonies as the Dutch, they have been prominent in African exploration. It was the Belgian king who sent Stanley to Africa, and the King of Belgium is sovereign of Kongo State.

Cities. — BRUSSELS, the capital and largest city, situated in the heart of the kingdom, is about the size of Boston. The name Brussels carpets suggests one of its industries; but carriage making and lace making are at present among its most important kinds of manufacture. It is an intel-

lectual as well as a political and commercial centre, having numerous picture galleries, museums, and schools.

ANTWERP, next in size, is situated about sixty miles from the sea, on a small river. Some of the great steamship lines from New York have their European terminus there, and the port is one of the most important on the



FIG. 153.

A view in Ghent. Notice the peculiar architecture of the houses.

continent. The leading kinds of manufacturing are sugar refining, distilling, lace making, and shipbuilding.

Many other cities are distinguished for manufacturing. The largest are LIEGE, the "Birmingham of Belgium," engaged in the manufacture of firearms, cutlery, glass, and various kinds of machinery; and GHENT (Fig. 153), noted for linen and cotton goods, and for machinery.

Luxemburg, on the southeastern border of Belgium, is a small duchy governed by a hereditary grand duke and a par-

liament. Like Belgium, by agreement of the powers of Europe, it is neutral territory. Agriculture, iron mining, and manufacturing are the principal industries.

Review Questions. — **THE NETHERLANDS.** — (1) Tell about the physiography of Holland. (2) What are the principal mineral products? (3) How does Holland compare with New York in size and population? (4) Tell about the people; the government; agriculture. (5) State reasons for reclaiming the land. (6) Tell how it is done. (7) What has aided the development of manufacturing? (8) Give three reasons for the extensive development of Dutch commerce. (9) How have the Dutch come to have several important colonies? (10) Name the principal colonies. (11) Tell about the chief cities.

BELGIUM. — (12) Compare Belgium with Holland as to physiography. (13) Tell about the importance of Belgium; its people and government; its agriculture; its mining and manufacturing. (14) What reasons are there for its important commerce? (15) What about colonies? (16) Locate and tell about each of the cities. (17) What about Luxemburg?

Suggestions. — **THE NETHERLANDS.** — (1) Why are the winds likely to blow with special force and regularity across Holland? (2) Why is this fact of value to the Dutch? (3) What effect must the winds have upon the rank vapors that rise from the damp soil? (4) What do you know about the flower gardens of the Dutch? (5) Have you seen any Dutch pottery, especially Delft wares? (6) Why did not the Pilgrims remain in Holland instead of coming to America? (7) Why should not Rotterdam be as large a city as New York? (8) Find out about the Peace Conference of 1899 at The Hague. (9) What reasons are there for selecting a small country like Holland for this purpose, and for making treaties between nations which have been at war?

BELGIUM. — (10) There are greater extremes of temperature in Belgium than in England. Why? (11) Find out some facts about the battle of Waterloo. (12) Give several reasons for spading instead of ploughing land. (13) Examine a piece of lace. From what material is lace manufactured, and how is the work done? (14) Towns in Belgium usually have two names. Why? (15) Would you expect fishing to be as important an industry with the Belgians as with the Dutch? Why?

XII. FRANCE

MAP QUESTIONS (Fig. 155). — (1) France is the nearest country to the British Isles. Estimate the distance. (2) Compare the two countries as to area. (3) As to population. (4) What waters border France? (5) What countries? (6) In what respects is its position favorable to commerce? (7) What do you observe about the general direction of the rivers? (8) Locate the island of Corsica, a part of France.

People and Government. — The early inhabitants of France, called Gauls, were conquered by the Romans (p. 165), who taught them their language and many of their customs. After the fall of Rome, France, like



FIG. 154.

A valley on the French side of the Pyrenees.

most European countries, was divided into independent kingdoms, which were often at war with one another or with neighboring countries.

The situation of France has, however, tended to bring the kingdoms together; for the country is enclosed on two sides by the sea, and elsewhere, in large part, by mountains. Notice how completely the Pyrenees — which

range from six thousand to ten thousand feet in height — separate France from Spain; and notice what a barrier the lofty Alps form along the Italian and Swiss boundaries. Even north of the Alps, a part of the boundary is formed by highlands. While the inhabitants were thus protected from invasion, there were few barriers within France itself that kept them apart. It was not difficult, therefore, to bring them under one rule.

Monaco in the southeast, and *Andorra* in the Pyrenees (p. 240), are the only exceptions. The principality of *Monaco*, only eight square miles in area, is a noted winter resort because of the fine climate. Its revenue is obtained from the gambling tables at *Monte Carlo*.

Owing partly to the close union of the people, France has at several periods approached first rank among European nations. Indeed, at the beginning of the last

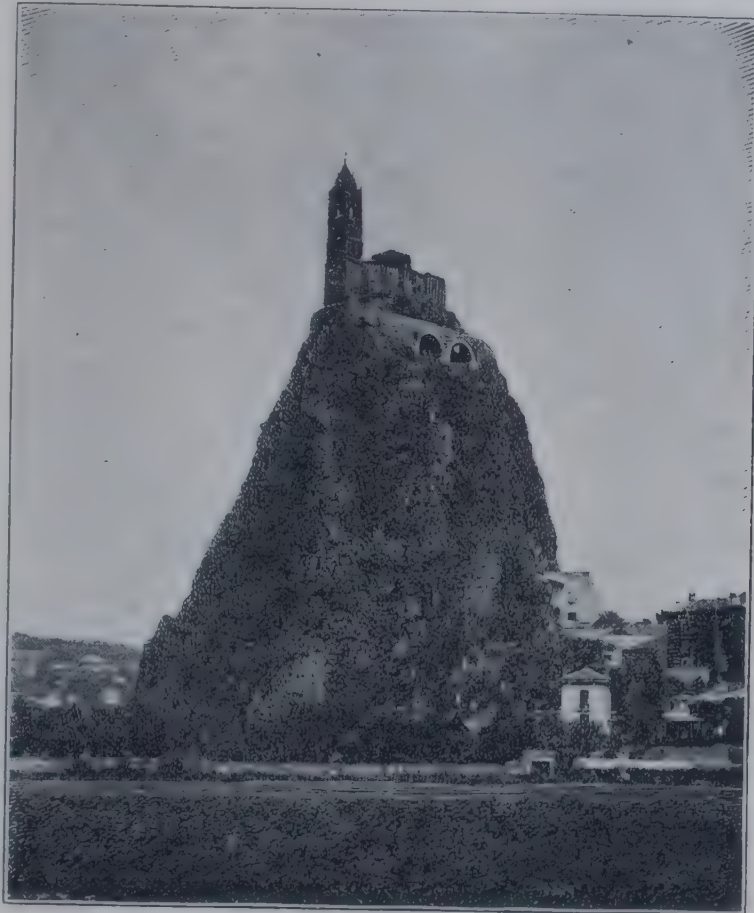


FIG. 156.

A view in central southern France (Monts d'Auvergne on the map). This is a region of extinct volcanoes (Fig. 158), and the church is built upon a steep lava hill.

century, under the lead of Napoleon Bonaparte, she was beyond question the most powerful of them all. Just previous to that time the people had developed such a hatred of monarchy that they rose in a mass, overturned the government, and formed a republic. There have been numerous changes since then, including a period when Napoleon himself was Emperor; but in 1871 a republican government, somewhat like that of the United States,



FIG. 157.

A street scene in Nice (near Monaco), showing the nature of the vegetation in that warm climate. Find out whether Nice is north or south of your home.

was once more established. This has continued down to the present time, and under its administration France still ranks as one of the six Great Powers of Europe.

Physiography and Climate. — As we have seen, the chief highlands of France are in the south and southeast. Among these highlands the loftiest are the Alps, whose highest peak, Mt. Blanc (15,781 feet), is in France. Had the mountains stretched along the western coast, the history of France would have been very different. As it

is, the prevailing westerlies are allowed to distribute their rain somewhat evenly over the country, supplying all sections with an abundance of moisture for agriculture.

The position of the highlands is of great importance for commerce as well as for farming. Fully three-fourths of France is a comparatively level plain sloping westward from the low central plateau, which rises steeply as the western wall of the long Rhone valley. All but one of the large rivers rise in this plateau and flow gently down its slope to the Atlantic. Thus navigation is possible far into the country. Locate and name the three largest rivers. How does the Rhone differ from the other two?

As might be expected, the summers are warmer than in England, since France lies almost entirely south of that country and is less under the influence of the ocean. The southeastern section, though as far north as Boston, has a semi-tropical climate (Fig. 157), owing to the presence of the warm Mediterranean waters and to the protection from cold north winds afforded by the Alps (pp. 162 and 163). These facts give promise of several important farm products that could not thrive in England.

Agriculture. — France is primarily a farming country, and nearly half the people devote their energies to agriculture, including grazing. The same grains are raised as in England. What are they? (p. 181). Wheat is the most important, and more of this grain is produced than in any other European country excepting Russia. Yet France raises only about half as much wheat as the United States, and not nearly enough for the needs of her people. Grapes, not important in the British Isles, thrive in the warmer climate of central and southern France.

Grapes form the most valuable of all French crops, and more are raised in France than in any other country of the world. This fruit, although capable of enduring severe cold, requires a warm summer. The distribution of the vineyards, therefore, shows forcibly the difference between the climates of England and France. Grapes do not mature well in northern France, but they flourish in the warm valleys from the Loire southward.

The Rhone valley and the Mediterranean coast are further noted for their groves of olive, orange, and mulberry trees. The latter are cultivated for the sake of their leaves, which are fed to the silk-worm (p. 229).

As in other countries, the highlands, as a rule, are capable of little cultivation and are usually given over to grazing.



FIG. 158.

A farm scene in southern central France. The mountain peak is an extinct volcano, one of the Monts d'Auvergne (Figs. 154 and 156).

Give examples from other countries. As in England, too, there are broad tracts of lowland which are better adapted to the production of grass than to other crops. These facts explain why there are more than thirteen million

cattle and twenty-one million sheep in France. What does that signify in regard to manufacturing?

Minerals. — France is quite inferior to the British Isles in its mineral products. Coal is the most valuable min-

eral; but while Great Britain, after supplying her many factories, exports a large amount of coal, France has to import some. The principal coal beds, from which more than half the output comes, lie close to Belgium. They are, in fact, a continuation of the deposits that were found to be so plentiful in that country. The other beds are small and scattered, but the best of them lie near the centre of the country, not far from ST. ETIENNE. Of what advantage is this location?

The quantity of iron produced is small and comes mainly from the northeast, near the coal fields. Fine clays for porcelain abound in central France, and building stones are quarried in nearly every part.

Manufacturing. — In spite of the limited supply of fuel, France is a great manufacturing nation. Besides silk and wine, in the production of which this country is the leading nation of the world, there is extensive manufacturing of metal, cotton, and woollen goods. One reason for these manufactures is the fact that coal is easily obtained either in France or from the neighboring countries of Belgium, Germany, and England. Another reason has to do with the nature of the people themselves.



FIG. 159.

A village in southern France.

When considering the manufacture of cotton goods in the cotton belt of the United States, the statement was made that it required such skill to control the machinery, that the untrained negroes had hitherto been little identified with cotton manufacturing. The English, however, possess a high degree of skill, and their manufactured goods have in consequence been both cheap and durable. It is partly on this account that they

have developed manufacturing to such an enormous extent.

But the Frenchman has, in addition, a peculiar appreciation of what is graceful, delicate, and elegant. This is illustrated by the fact that our fashions in dress originate in France; and a skirt, a pair of gloves, or a bonnet from Paris is expected to be a trifle more desirable than that bought elsewhere. The French have accordingly specialized in this direction; and thus their artistic sense has had great influence upon both the kind and amount of their manufacturing. Their artistic taste is exercised less, however, upon cotton than upon other goods; for the cotton mills are mainly



FIG. 160.

A cliff dwelling in southern France. There are not many of these houses; but the fact that there are any suggests how very poor some of the peasants must be.

engaged in furnishing simple, inexpensive cloth to the large number of peasants and other poor people.

Wool and Cotton Manufactures.—The northern part of France, including LILLE, ROUBAIX, and REIMS, as well as cities near the mouth of the Seine, is the section especially noted for the woollen industry. Here coal is

most easily obtained; and large numbers of sheep are raised on the hills and plains near by. Besides this, foreign wool from Argentina and Australia is easily imported **at** HAVRE and at the Belgian port of Antwerp. Remembering that the goods turned out—as hosiery, carpets, and underclothing—are of high grade, and such as wealthy people wish, we see that this location, between the two wealthiest capitals of the world, is specially advantageous. Woollen cloths are, next to silk goods, the most important French export to Great Britain.

Cotton manufacturing—mainly for the home market, as indicated above—is also extensively developed near the coal fields of northern France. An important reason for such work at this point is the ease with which American cotton may be imported; and this explains why ROUEN on the Seine is a prominent centre for cotton goods. There are also cotton factories in eastern France, where water power is used instead of steam power. Why should there be water power in that section?

Silk Manufacturing.—Because the climate and soil of the Rhone valley are adapted to the mulberry tree, and because coal mines are near by, this section is a great silk-manufacturing region. LYON is the centre, although ST. ETIENNE and PARIS are also noted for this industry.

The traveller in the Rhone valley sees grove after grove of mulberry trees, carefully cared for in order to supply an abundance of leaves for the silk-worm to eat in summer.

The silk-worm moth, at the end of the caterpillar stage, weaves a cocoon about itself. The material of which the cocoon is composed is a thread, about two miles in length, which must be very carefully unwound. The single strand is such **extremely fine silk** that, in order to make a fibre strong

enough for spinning and weaving, it is united with several others.

Since the worms are reared under cover, the silk industry may be carried on in any climate well adapted to the mulberry tree. It is possible, therefore, to make raw silk in many parts of the world; but the feeding of the worms and the transformation of the cocoons into silk for the market require much labor, care, and skill. On that account silk production is chiefly confined to those parts of the world where laborers



FIG. 161.

A view looking over Paris, with the Seine in the centre of the picture.

will accept low wages, and where, owing to generations of such work, habits of watchfulness and care have been developed. China accordingly produces the greatest amount of raw silk; but France, in the midst of the civilized world where the market for silk goods is greatest, also produces a large quantity and is the leading country for the manufacture of silk. Make as long a list of silk goods as you can.

Other Manufactures. — The extensive cultivation of grapes has been referred to. Much of the wine made from them is consumed at home, for in France even the day

laborer very often drinks wine at his meals in place of or mixed with water. An enormous amount of wine is also shipped abroad, as for example to London, whose wine cellars have already been mentioned (p. 196). The manufacture of steel goods is important in some places, but to no such extent as in Great Britain. Other kinds of manufacturing are mentioned under the cities.

Paris. — Paris, the capital of France, is the largest city on the continent of Europe and the third largest in the world. It numbers more than 2,500,000 inhabitants.

Location (Fig. 162). — As in the case of London, there is a definite reason for the exact site; for an island in the Seine at that point made the river easier to bridge over, while at the same time it aided in defence. Aside from that, the Seine, having a slower current than the Rhone, and being less subject to overflows than the Loire, is more easily navigable than any other river in France. Its upper tributaries bring it into close touch with eastern France; and, by the aid of canals, there is water connection with the Loire and Saone, and with the Rhine in Germany. Furthermore, Paris is situated on the main trade route from the Mediterranean to northern and central France, which follows the Rhone, the Saone, and the Seine. In addition, Paris is located in the midst of the most fertile portion of the country, and not very far from several other densely populated countries. For these several reasons it has always been the principal French city.

Paris as an Art Centre. — Reference has already been made to the appreciation of grace and elegance characteristic of the French people. Napoleon and other rulers collected art treasures from various nations, and founded collections and schools which have made Paris famous.



FIG. 162.

To show Paris and surrounding country. Notice how closely the railways follow the stream valleys. Why should they?

The superiority of the city in this respect is recognized in America by the large number of men and women who go there every year for the study of art. It is not strange, therefore, that Paris should be distinguished the world over for its beauty as a city. The wide streets, the beautiful parks with their fountains and statues, and the fine public buildings and old royal palaces, are wonderfully attractive. Even the dwelling houses are in harmony, for it is required by law that new buildings must har-

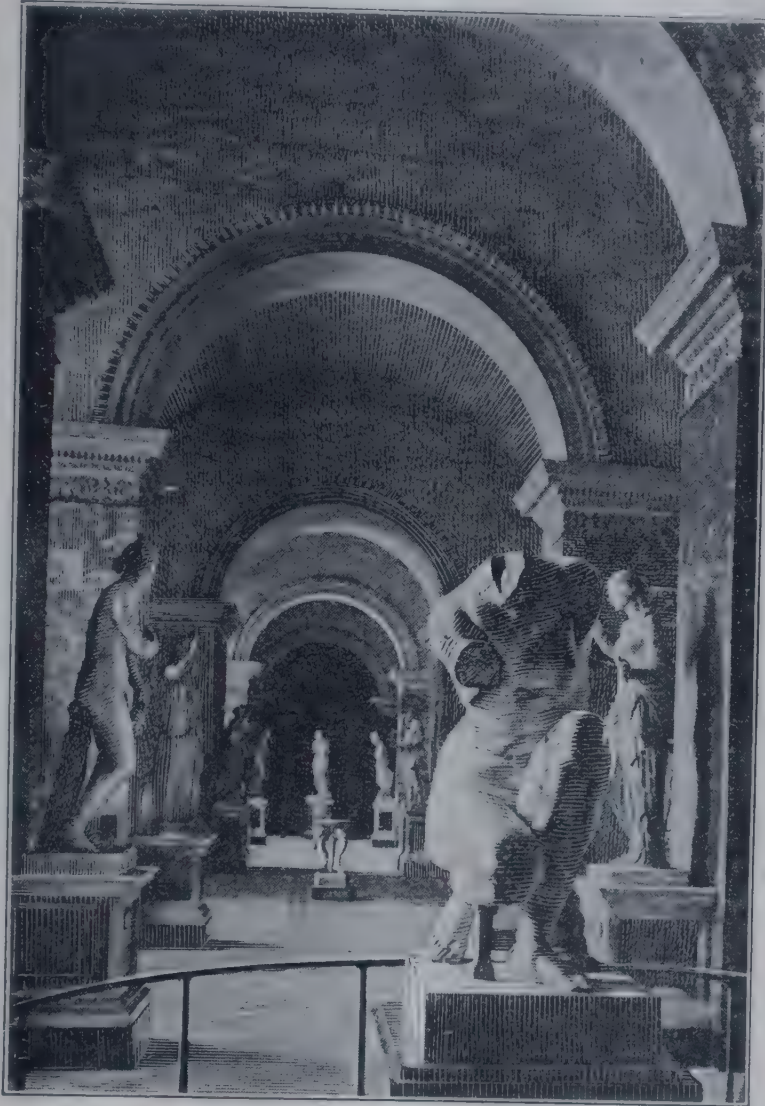


FIG. 163.

Statues in the Louvre — the Venus de Melos at the farther end of the hall.

monize with those near by. Therefore one seldom sees an unattractive house in Paris.

One of the old palaces, known as *the Louvre*, is the most noted art gallery in the world. It contains thousands of works of art, the most celebrated of all being the Venus of Melos (Fig. 163), discovered in 1820 on the little Greek island of Melos

in the Mediterranean Sea. Among the paintings, one of the most famous is Raphael's Madonna and Child with St. John, pictures of which are often seen in our country.

Among the many interesting suburbs of Paris is VERSAILLES, where there is another palace that was erected in the days of royalty. It is now mainly used as a museum, and scores of the large rooms are decorated with the finest of paintings. It is among such treasures that the students of art spend much of their time; and it is partly because of the beautiful surroundings that many foreigners reside permanently in Paris.

Manufactures of Paris. — Like other great cities, Paris has too many industries to be specially identified with any one. Yet the superior taste of the Parisians has led them to pay especial attention to the manufacture of articles which combine utility with beauty, such as jewelry, furniture, gloves, fashionable shoes, etc. The Sèvres porcelain is made in the suburbs of Paris, and both this and the Limoges ware, manufactured at Limoges, are celebrated for their beauty.

Commerce of Paris. — Although so far inland, Paris ships more goods by water than any other French city. The extensive canal connections have already been mentioned (p. 231). Vast sums have been spent in dredging the lower Seine, so that the depth of water between Rouen and Paris now exceeds ten feet. Small vessels can proceed directly to Paris, but larger ships transfer their goods at HAVRE and ROUEN. Besides this, the chief railways of France radiate in all directions from Paris (Fig. 162). All together, therefore, Paris is the political, artistic, manufacturing, and commercial centre of France.

Other Cities. — HAVRE, which is almost as busy a harbor as MARSEILLE, has an extensive trade in coffee from Brazil, and in wheat and other materials from the United States. Another important port is BORDEAUX, on the Garonne River, in the midst of a fertile grape-raising

district. It is the chief port for the export of French wines. Locate the cities previously named and tell for what each is important. Note especially LYON, next to Paris in size, and a little smaller than Baltimore.

The third French city in size, and its leading seaport, is MARSEILLE, which is almost as large as Lyon. The delta of the Rhone is too marshy for a city, and Marseille occupies the nearest point where there is a good harbor and where other conditions are favorable for a town.



FIG. 164.

Fontainebleau, a beautiful wooded park south of Paris.

For many centuries the Rhone valley was the principal gateway from the Mediterranean to much of Europe. One route leads to the Seine valley, and thence to Paris (p. 231), northern France, and Belgium. Another enters Switzerland through Lake Geneva, out of which the Rhone flows; and still a third route leads, through an opening in the mountains, into the Rhine valley and Germany.

Since Marseille is the sole good seaport for the Rhone valley, it is not surprising that it has long been a great shipping point for wares to and from Asia and the shores of the

Mediterranean. Among its chief imports are grain from Russia and Italy; oil seeds of various kinds from India and Africa; wines and dried fruits from the shores of the Mediterranean; and rice, tea, spices, and silk from the East. What must be some of the exports? The olives raised in the neighborhood make the refining of olive oil an important industry.

Commerce of France. — Notwithstanding the great amount of internal commerce on the numerous rivers, canals, and railways, and notwithstanding the extensive foreign trade, France is not a great maritime nation like the United Kingdom (p. 202). In fact, her merchant marine is only one-tenth as large as that of the British Isles and three-fifths that of Norway. This is not entirely because of lack of acquaintance with the sea, for there are more French than British fishermen. The small number of good harbors, and the frequent and destructive wars during the last century, are among the reasons why France depends so largely upon other nations, as upon British and Norwegians, for vessels to carry her goods. Why is it safer for her to be thus dependent than for Great Britain?

Colonies (Fig. 193). — On the other hand, France has been extensively engaged in exploration. You may recall her plan to take possession of Canada and the Mississippi valley. A large number of people in the province of Quebec and in New Orleans — where the French made their largest settlements — still speak the French language. Although this territory was given up, France still owns two small islands near Newfoundland. Other possessions in the New World are French Guiana in South America, and some small islands in the West Indies.

In Asia, France holds a part of Indo-China and a very small bit of India; and she has numerous islands in different portions of the world (Fig. 193). But her most important colonies are in Africa, as follows: (1) Algeria and Tunis, across

the Mediterranean; (2) a vast area south of these countries, including a large part of the Sahara Desert, the Sudan, the upper Niger, and the country north of the Kongo River; and (3) the large island of Madagascar, east of southern Africa.

REVIEW QUESTIONS.—(1) Tell about the early inhabitants; (2) the influence of the boundary line for unity; (3) the government; (4) the physiography and climate. (5) What are the principal farm products? (6) Which of these have been found in Great Britain? (7) Which have not been found there? Why? (8) Tell about the mineral products. (9) Give reasons for the extensive manufacturing. (10) Tell about the woollen manufactures. (11) Cotton manufactures. (12) Tell about silk and silk manufacturing. (13) What about other manufactures? (14) Tell about Paris: its size; location; artistic attractions; manufactures; commerce. (15) Tell about: (a) Havre, (b) Bordeaux, (c) Lyon. (16) What are the reasons for the location of Marseille? For what is it important? (17) What is there peculiar about the commerce of France? (18) Tell about the colonies.

SUGGESTIONS.—(1) What is the name of the present President of France? (2) Give reasons why one river, as the Loire, might be much more subject to overflows than another, as the Seine. (3) Examine Figure 114 to see if the glacier reached into any part of France during the Glacial Period. (4) Raise a silk-worm from the egg. (5) Examine a cocoon and see if you can unravel some of its thread. (6) Also unravel a piece of silk goods and examine the threads. (7) What influence on the commerce of Marseille has the construction of railway tunnels through the Alps probably had? (8) The construction of the Suez Canal? Why? (9) Why is the present French language so different from Latin, though the French formerly spoke Latin? (10) See if you can find any porcelain ware from Sèvres or Limoges. (11) What changes might be brought about in your locality if the people there prided themselves greatly on the beauty of the streets, houses, etc., as the Parisians do? (12) What pictures of fine statuary have you seen? (13) Find the names of some of the great French painters. (14) Read some stories from French history; for example, the story of Roland in the days of Charlemagne, when the Pyrenees helped the French to keep the Saracens back; the story of the French Revolution; the story of Joan of Arc, etc. (15) Make an outline sketch of France, with the principal mountains, rivers, and cities. (16) On an outline map of the world, sketch in the French colonies with their names.

XIII. SPAIN AND PORTUGAL

MAP QUESTIONS. (Fig. 155.) — (1) What other cities in the world are in about the same latitude as Madrid? (2) Compare the area of the Spanish peninsula with that of France (App. II.). (3) Compare the populations (App. II.). (4) Compare the directions taken by the rivers. (5) Judging from the map, what would you expect as to the number of good harbors? (6) What has been stated about the temperature and rainfall in Spain? (pp. 161 and 164). (7) What islands in the Mediterranean Sea belong to Spain?

People and Government. — The people of this peninsula once had much the same rank among nations as is now held by the British. Name countries that they controlled. Mention some noted Spanish and Portuguese explorers.

Now, however, both Spain and Portugal are classed among the weaker nations of Europe; and, strange to say, the very successes which they formerly attained were one cause of their downfall. In the first place, their many discoveries and foreign conquests withdrew large numbers of the most energetic citizens from the peninsula. And, in the second place, the vast amount of gold and silver brought from Mexico, Peru, and elsewhere allowed many of those persons remaining at home to give themselves up to lives of enjoyment and luxury. Thus the characters of the people at large were seriously undermined.

In its earlier history Spain developed a spirit of intolerance that has also proved a serious obstacle to progress. Being within easy reach of Italy, the peninsula, as a whole, became Christianized by the Romans. But after the downfall of Rome, the *Moors* of northern Africa, who

vere Mohammedans, and therefore avowed enemies of Christians (p. 93), invaded Spain from Morocco, and conquered most of the country.

This was about 700 A.D. ; and for nearly eight centuries after that there was almost constant warfare between the two peoples, the Christians maintaining themselves in the north, and the Mohammedans in the south of the pen-



FIG. 165.

The Alhambra, one of the last strongholds of the Moors.

insula. Gradually the Moors became confined to Granada in the southern part ; and in 1492 they were finally overcome even there, and largely expelled from the country.

The Moors were a wonderfully enlightened people, and they developed agriculture, industry, commerce, and architecture to an extent the Spaniards have never equalled. But the long struggle between the two races and religions, and the defence the Spaniards made, embittered them not only against the Moors, but also against others who disagreed with them in religious faith. This spirit

of intolerance, which has, in a measure, continued down to the present time, is one cause of the loss to Spain of her foreign territory. It led to religious persecution, which resulted not only in the death of many persons, but also in additional loss of population through the departure of many whose energy and industry were of great value to the country. Some Jews were also driven out, and thus the country was deprived of farmers, artificers, and tradesmen of higher grade than the warriors who remained.

The mountainous character of the peninsula has been a third cause for the decline of Spain and Portugal. The various races on the peninsula, cut off from one another by table-lands and mountain ranges, have never been fairly blended into one people, as we have seen (p. 174) was done in Great Britain. For centuries they were divided into small, independent kingdoms having different languages. Just before the discovery of America, however, most of these states were brought under one rule by the marriage of Ferdinand and Isabella; and later even Portugal was joined to Spain.

But Portugal, which is naturally separated from Spain by deep gorges and canyons, soon broke away. Also *Andorra*, a tiny country in the Pyrenees, was never fully conquered and is still independent; and the union of some of the others has been by force rather than by choice. At present the parts of Spain are held together under a limited monarchy, and the same is true of Portugal.

Altogether, then, the lack of industry among the Spanish, their pride and intolerance, and their lack of union have been serious drawbacks both in the government of colonies and in growth at home. While numerous other

European nations have been advancing they have been steadily losing power. The Portuguese, however, have suffered much less in this respect than the Spanish.

Physiography and Climate. — The key to many important facts about Spain and Portugal is found in the extensive elevation of the land. On the northern boundary stand the Pyrenees, continued on the west by the Cantabrian Mountains, while in the extreme south are the lofty Sierra Nevada ranges. Between these two systems is a broad plateau, from two to three thousand feet in elevation, with numerous short, broken mountain ranges.

In the Ebro valley on the northeast and the Guadalquivir (meaning Great River) valley on the southwest there are lowlands. Point to these rivers on the map. The only other extensive lowland is a narrow strip near the sea, which reaches most of the distance around the peninsula. A very large proportion of the surface, therefore, is made up of plateaus and mountains.

This condition of elevated surface is important, in the first place, in preventing Spain from becoming a great thoroughfare for the transportation of goods. The position of the peninsula, between the two busiest seas of the world, and between Africa and central Europe, suggests that it might be a valuable route for commerce. But the highlands *separate*, rather than unite, these regions.

The highlands have an important influence also on the climate. Owing to the elevation the interior has cold winters, though the summers are hot; and because of the fringe of mountains, the rainfall is light everywhere excepting near the coast, where the vapor is condensed in rising over the slopes. Thus, while the northwestern coast receives from 30 to 60 inches of rain per year, the

amount decreases toward the interior until, at MADRID, there is a rainfall of only about 10 inches. Why so much rain in the northwest? The southern portion of Spain, like southern California, being in the horse latitudes (p. 161), is so arid that agriculture without irrigation is impossible.

There are several other effects produced by the highlands. In the first place, the rivers are unnavigable; for in descending from the arid plateau to the coastal plains their courses are rapid and their volume slight. Besides that, most of them have cut such deep, narrow valleys, like that of our Colorado Canyon, that they are not only useless for irrigation but are even a great hindrance to communication. The Guadalquivir, which has a wide valley and which vessels are able to ascend as far as SEVILLE, is the principal exception.

Since the interior is so arid and rugged, it must have little timber, little agriculture, few people, and few roads, railways, and canals. With one or two exceptions, therefore, the chief towns are to be found along the coast.

Agriculture and Grazing. — In one respect the elevation of the land is an advantage because it insures great variety of climate, and hence many kinds of farm products. What countries of South America does this condition call to mind?

We may expect grazing in the uplands and among the mountains, as in similar rugged and arid regions elsewhere. Name some of them. Spain is noted for the excellent grade of its sheep and mules. There are also many cattle, especially in the rainy northwest; but the fact that so much of the country is arid explains why there are many more sheep and goats than cattle. The sheep often wander about in flocks of ten thousand under the care of a number of shepherds and their dogs. In

summer they feed among the mountains, but in winter they are driven down to the more protected lowlands for shelter.

Wheat is the most common crop in Spain, since it requires comparatively little rain.

Although a large amount of wheat is raised, there is far less than might be, since so many of the Spaniards lack energy and enterprise. For example, they



FIG. 166.

A sheep pasture at the Convent of Palos in Spain.

use antiquated methods of farming, such as rude wooden ploughs drawn by oxen, and sickles for cutting the grain by hand. Horses and goats are employed in threshing to tramp the wheat kernel from the chaff, as is done in New Mexico and Spanish countries south of the United States.

In many of the valleys where irrigation is possible, and especially on the lowlands along the coast, the farmers are more progressive and prosperous. Besides wheat, barley, rye, and corn are raised, and these are among the staple foods of the people. Quantities of grapes are also grown in Spain and Portugal; and in the southern part of the peninsula the bark of the cork oak is a source of income to both countries.

The arid southeastern coast is wonderfully productive. One reason is the warm climate, due to the influence of the Mediterranean; another is the number of mountain streams, which, though useless for navigation, are extremely valuable for irrigation. Some of the products of this section, besides wheat and corn, are cotton, grapes, olives, figs, dates, oranges,

lemons, and rice. Several crops of some products may be raised in a year. But the development of the region, with its admirable irrigation works, is the result of the genius and energy of the Moors, rather than of the Spaniards.

Mining. — Spain is remarkably rich in minerals. Lead and silver are mined in the upper valley of the Guadalquivir, and along the southeastern coast. Some distance northeast of SEVILLE a large quantity of *quicksilver*, or



FIG. 167.

A wooden-wheeled ox cart, to illustrate the backwardness of the Spaniards.

mercury, is obtained. Northwest of Seville, and in southern Portugal, are some noted copper mines which are worthy of comparison with the copper mines in northern Michigan and Butte, Montana. Coal and iron ore are found in several parts of the peninsula, but the largest output of each occurs on the northern slope of the Cantabrian Mountains (Fig. 168). Spain produces more quicksilver than any other country, and is exceeded only by the United States in the output of copper and lead.

Here, however, as in other industries, the character of the people prevents proper development of the resources. Much

of the benefit from the mines is due to the capital and enterprise of foreigners; the English and French are in control of the copper mines, and the Rothschilds own the quicksilver.

Manufacturing. — From what has been said above it is apparent that manufacturing cannot flourish. This fact is all the more evident when we consider that more than two-thirds of the Spaniards, and three-fourths of the Portuguese, cannot

read. Thus, although they have coal beds, much of their iron ore, instead of being smelted at home, is shipped to the coal fields of Swansea in Wales to be smelted. In some places, however, as will be seen in the study of the cities, there is manufacturing of certain kinds.

Principal Cities of Spain. — MADRID, the metropolis and capital of Spain, is nearly as large as Baltimore; but unlike most other large cities so far studied, it is not an important manufacturing centre. Why not? The explanation of its size is found in its central location, and the fact that it is the seat of government. In crossing the peninsula to connect the coastal cities, all the principal railway lines converge at this point, and thus Madrid has become the intellectual and political centre of the country.



FIG. 168.

One of the great pits from which iron ore is obtained at Bilbao, Spain.

To some extent, Madrid, with its wide streets, magnificent royal palace, and one of the finest art galleries in the world,



FIG. 169.
A Spanish bull fight.

recalls the attractions of Paris. But one of its most frequented places is an enormous building, which seats many thousands and which is used for bull fighting. In its indulgence in this brutal sport the city bears no resemblance to Paris; nor is there any resemblance in its surroundings. From the

streets of Madrid one looks across the country for miles and miles, seeing not a tree nor fence nor house; only the weeds and scattered vegetation of an arid waste.

In the vicinity of Madrid is a labyrinth of buildings, called the *Escorial*, a royal palace and monastery erected by the king, Philip II. Although built at great expense, in a village about twenty-five miles from Madrid, it now stands idle, competing in interest to the visitor with a chocolate factory near by, and serving strongly as a reminder of the extravagance of the ruler of Spain at the height of its glory.

The city next in importance upon the highlands of Spain is GRANADA, the last stronghold of the Moors. To this point among the mountains, at the intersection of the best routes of travel from east to west, and from north to south, these people withdrew. Here they main-

tained themselves for two hundred years and developed a city of four hundred thousand population. At present, Granada contains less than one-fourth as many inhabitants, and its principal attraction is the Moorish palace, or Alhambra (Fig. 165), one of the finest examples of Moorish architecture in existence.

On the outside, this castle presents only bare stone walls, as ugly as such walls usually are; but within, all is beauty. The courts, with marble fountains of surpassing grace in the centre, and with arcades which have exquisitely carved columns and ceilings of marble, are particular attractions.

On the lowlands west of Granada are SEVILLE and CADIZ, both flourishing cities at the time when vast stores of plunder were being brought from the Spanish colonies in the New World. CADIZ is now a fortified naval harbor; and SEVILLE is recovering a degree of her former commercial importance. One tobacco factory in Seville employs about five thousand women in making cigars and cigarettes.

A Moorish palace at Seville, called the *Alcazar*, rivals even the Alhambra as a marvel of carving in stone. In summer this is one of the hottest cities in Spain, and the buildings, almost invariably white, cause the city to appear in the distance like a solid mass of white marble. Why should that color be selected for buildings in a hot country?

Gibraltar, a steep hill, with bold cliffs rising on nearly all sides, and with a town at its base, has belonged to England since 1704. This rock hill (Fig. 170) is, perhaps, the strongest fortification in the world, and guards the entrance to the Mediterranean. Why should the English especially want such a stronghold there?

Malaga grapes serve to remind us of the coastal city by that name, and of the products about it. It has one of the warmest climates in Europe; and in addition to grapes, such semi-

tropical fruits as olives, dates, and lemons are cultivated in its vicinity. MALAGA has a poor harbor, but good roads lead northward from this point over the mountains, and it is a point of export for wine, raisins, and fruits.

VALENCIA and BARCELONA are the leading seaports of Spain. The region about the former is a beautiful garden, much like southern California, which it resembles also in products. Name some of the products. In addi-



FIG. 170.

The rock of Gibraltar from the Spanish coast, showing the narrow neck of land which connects it with the mainland.

tion, rice, one of the staple foods, is grown on the lowlands near the coast. BARCELONA, the second Spanish city in size, is the principal seaport and an important manufacturing centre as well. Cotton and other textiles are its principal manufactured goods.

On the whole Spain is poorly provided with harbors; and while the majority of the people dwell near the coast, and many engage in fishing, they take a small share in international commerce.

Colonies of Spain. — The only remnants now left to Spain of her once magnificent foreign possessions are for the most part

in Africa. These include a few small settlements on the coast of Morocco; a portion of the western coast of Sahara, having little value; and a few small islands in the Gulf of Guinea. The Canary Islands west of the northern coast of Africa and the Balearic Isles in the Mediterranean also belong to Spain.

Principal Cities and Colonies of Portugal. — LISBON and OPORTO are the chief cities of Portugal. The former, the capital and metropolis, lying on a broad bay

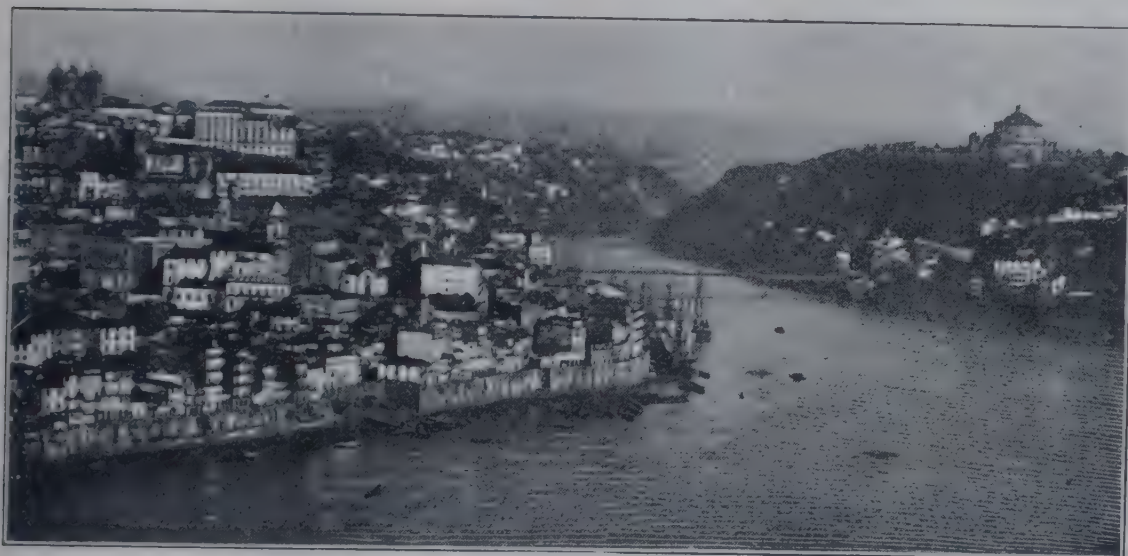


FIG. 171.

The harbor and city of Oporto. Describe the situation of the city.

where the Tagus River enters the sea, has one of the finest harbors in the world. With its white houses, its cathedrals and palaces — all partly buried in trees on the hill-sides surrounding the harbor — it vies in beauty with the most attractive cities in the world.

The misfortunes of Lisbon have been many. It has suffered from sieges, plagues, and earthquakes. The most terrible catastrophe happened in 1755, when an earthquake, followed by fire, destroyed most of the houses and a large part of the population.

OPORTO gives the name to Port wine. The lower part of

the Douro valley is one of the richest wine districts in Europe, and Oporto, like Bordeaux, is an important point for its export.

Portugal, like Spain, and partly for the same reason, has lost much of her foreign territory. The Azores Islands, far to the west in the Atlantic, and the Madeira Islands, to the southwest, are a part of the kingdom. A number of the Azores Islanders have settled in Gloucester and other fishing centres of New England, where they are among the most successful fishermen. Why should they be thus skilful? The Cape Verde Islands, also a volcanic group, off the coast of Africa, are treated as dependencies. Portugal also has large possessions on the mainland of Africa and smaller ones in Asia.

REVIEW QUESTIONS. — (1) Tell about the former greatness of Spain. (2) Give some of the causes of her downfall. (3) What kind of government has Spain? (4) Portugal? (5) Describe the highlands of the peninsula. (6) Mention several consequences of this elevated condition of the land. (7) Tell about agriculture and grazing. (8) Tell about the mining. (9) What can you say about manufacturing? (10) Give the main facts about the following cities: (a) Madrid, (b) Granada, (c) Seville, (d) Cadiz, (e) Malaga, (f) Valencia, (g) Barcelona. (11) For what is Gibraltar noted? (12) What about the colonies of Spain? (13) Tell about (a) Lisbon, (b) Oporto. (14) What about the colonies of Portugal? (15) Name and locate the principal cities of Spain and Portugal. (16) The rivers.

SUGGESTIONS. — (1) About what portion of the boundary line between Spain and Portugal is formed by rivers? (2) What must be the influence of railways upon the old-fashioned methods of farming in the interior? (3) Recall the Spaniards' treatment of the Incas in South America. (4) Look in the report of the Twelfth Census to see what per cent of our population cannot read. (5) Read about the great fleet, called the Spanish Armada, that was once sent out to conquer England. (6) Find out about some events in our recent war with Spain. (7) Learn what is meant by the Pillars of Hercules. (8) Find other pictures of Moorish architecture. (9) Read Washington Irving's "The Alhambra." (10) Make a sketch of the Spanish peninsula, including the principal rivers and cities.

EUROPE

Scale of Miles
0 100 200 300 400 500 600

Capitals of Countries ● Other Cities ○

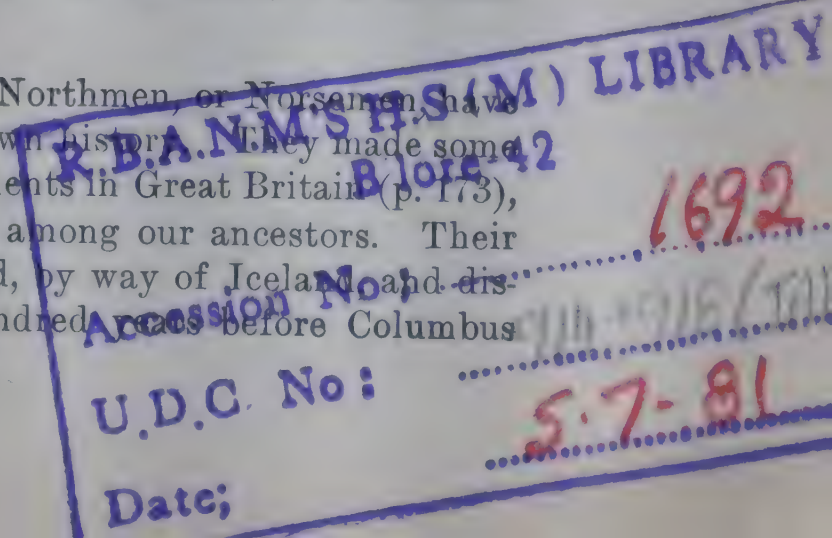


XIV. NORWAY, SWEDEN, AND DENMARK

MAP QUESTIONS (Fig. 172). — (1) The Scandinavian peninsula is the largest in Europe. What is its length in degrees? In miles? (2) How does its western coast remind you of the western coast of Scotland and Ireland? (3) What evidences do you see of glacial action? Where? (4) What do you observe about the rivers of Sweden? (5) Which of these three countries has the largest population? (6) How does it compare with New York State in area and population? With your own state? (See Appendix II.) (7) Make the same comparison for the smallest of the three countries. (8) What points in North America are in about the same latitude as Bergen, Christiania, and Stockholm? (9) On Figure 38, find how near to Scandinavia the Gulf Stream drift reaches.

People. — The people of these three countries have long been more or less united, for the well-settled southern portions of Norway and Sweden are not separated by any natural barrier, while only a narrow, shallow sea separates Scandinavia from Denmark. Being descended from a common stock, and at times having a single government, they have many interests in common. The written language of the Norwegians and Danes is still the same, and Norway and Sweden are united under one king, although they have separate local government. Denmark is now independent, and, like Norway and Sweden, is a limited monarchy.

These people, formerly called Northmen, or Norsemen, have been closely connected with our own history. They made some of the early invasions and settlements in Great Britain (p. 173), and are thereby to be numbered among our ancestors. Their daring seamen reached Greenland, by way of Iceland, and discovered America nearly five hundred years before Columbus



approached its shores. In the present century they have migrated to the United States by thousands, and have chosen homes in many states, but particularly in Minnesota, Illinois, and Wisconsin.

Physiography and Climate. — There are only about one-fourth as many inhabitants in these three countries together as there are in the British Isles; yet in spite of frequent European wars, they have preserved their independence through many centuries. This has been due in part to their peculiar position. The only land approach to Scandinavia is by way of Lapland in Russia, which is so far north that it is very cold. Thus the peninsula is almost as isolated from other nations as is Great Britain.

Denmark, on the other hand, is partly connected with Germany. However, the most important parts of Denmark, the islands, are completely separated by water. These islands and the Danish peninsula (Fig. 200) are the higher portions of a lowland that were left projecting above the water when sinking of the land changed the Baltic valley to a shallow sea (p. 152). Standing at the entrance to the Baltic, they guard the approaches to this inland sea, and naturally Germany, Russia, and other nations have long coveted them. But as neither of the Great Powers was willing that one of the others should hold them, little Denmark has been allowed to continue its independent existence.

The rugged surface and severe climate of Scandinavia have also served as a protection against invaders. From its southern to its northern end the peninsula is mountainous. It is an ancient mountain land (p. 150), much worn, and cut by deep stream valleys. While some peaks reach an elevation of six to eight thousand feet, most of

them are lower and of so nearly the same height that the upland resembles a plateau when viewed across the mountain crests.

The boundary between Norway and Sweden follows the divide between the east and west flowing streams; and since the mountains descend steeply into the ocean on the western side, those streams which flow toward the west are the shorter. Therefore, in all but the southern part, Norway is a narrow,

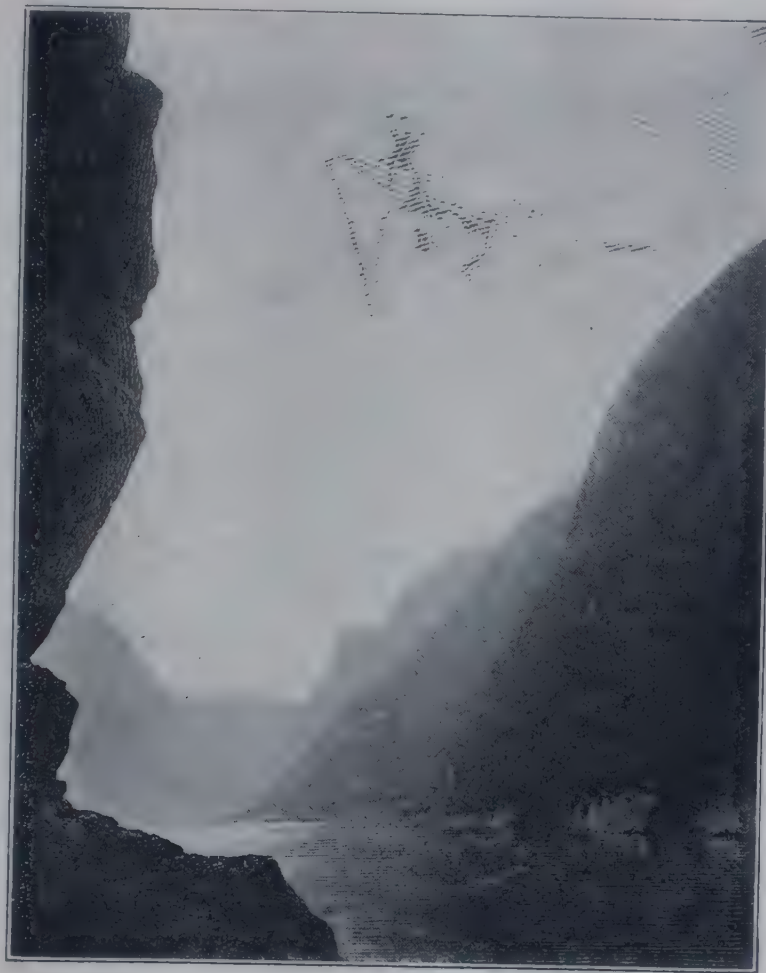


FIG. 173.

A Norwegian fjord with steep cliffs rising from the very water's edge.

mountainous region crossed by short streams flowing in deep, steep-sided valleys (Fig. 173).

Agricultural Districts. — The mountainous surface and cold climate are unfavorable to agriculture, although the warm ocean waters (p. 161) exert an enormous influence here, as in the British Isles. In rising over the mountains, the westerly winds supply abundant rain and snow, and it is the latter which causes the numerous glaciers.

Since the slope on the eastern side is much the longer, Sweden has extensive lowlands throughout its length. But these lowlands are so far north, and so protected from the influence of the sea, that in all but the southern part agriculture is of little importance.

Although Denmark is free from mountains, the northern and western portion of the Danish peninsula (called Jutland) is a sandy waste, so that only the islands and the southeastern part of the peninsula are very productive.

In these three countries, therefore, there is a comparatively small area that is valuable for agriculture, and the sections lie near together, namely, in southern Norway and Sweden and in eastern Denmark.

Industries and Cities of Norway. — Since less than four thousand (out of a total of one hundred and twenty-five thousand) square miles in Norway have a soil and climate adapted to agriculture or pasturage, the amount of stock and grain produced is small. Therefore, much meat, flour, and other food must be imported. Also, while there are some silver and copper mines, coal is entirely lacking, because the rocks were formed before the Coal Period. Manufacturing, therefore, is little developed. Even the fine water power is little used, because raw products for manufacturing are not abundant.

On what, then, do the two million inhabitants depend for a living? They have two valuable resources, — lumber and fish. More than one-fifth of the country is forest-covered — pines being most common — and lumber, wooden goods, and paper are the most important exports. As in Maine, the rapidly flowing rivers are of use in moving the logs from the forest, and also in supplying power for the sawmills and planing mills.

Fish abound on the shallow banks along the irregular western coast, especially codfish in the neighborhood of the far northern Lofoden Islands. The North Sea with its many fish is also close at hand, and the Arctic Ocean with its seals and whales. Over a hundred thousand Norwegians are engaged in the fishing industry. Along the fjords every family owns a boat, and knows how to make



FIG. 174.

Bergen, Norway, with its deep, narrow fjord harbor.

as well as use one. While the men are at sea the women work the small farms or garden patches.

The abundance of lumber and the love for the sea, developed through centuries of experience in navigating the deep fjords and in fishing, have given rise to a third great industry, that of carrying goods for other nations. The timber for wooden vessels is easily supplied, and this small Norwegian nation has at present a greater *number* of freight vessels than any other European country excepting the British Isles.

These facts help to explain why the Norwegian towns are found along the coast. Indeed, it is rare to find even a village in the interior. The two principal cities are CHRISTIANIA, the capital and largest city, and BERGEN (Fig. 174). The former is situated at the head of a long, narrow, sunken valley, or fjord, which makes an excellent harbor, and the city is the principal port and distribut-



FIG. 175.

North Cape, the northern point in Norway. The summer sun is shining here at midnight, because the cape is within the Arctic circle.

ing centre for southern Norway. Bergen is the important fishing port, as Aberdeen is in Scotland and Gloucester in Massachusetts. Being so near the open ocean, and therefore influenced by the warm water and warm ocean winds, this port is seldom frozen over. But the harbor of Christiania, with cold land to the north, east, and west, and a shallow sea to the south, freezes early and is ice-bound for four months in the year.

Scenery on the Western Coast. — As in the British Isles and northeastern North America, the sinking of the Scandinavian peninsula has caused the sea to enter the river valleys, forming many bays, peninsulas, and islands. It is estimated that there are fully ten thousand islands along the coast of Norway. Owing to the fact that, before the sinking took place, the river valleys were deeply cut in hard rock, the bays are usually long, narrow, and deep fjords (Fig. 173).

Some of the fjords extend fully ninety miles inland, and swollen streams from the mountains frequently plunge, for a fall of a thousand feet or more, over the vertical cliffs which bound the fjords. The cliffs are often only barren rock; but here and there, where the slopes are not too steep, green forests cover the surface; glaciers are frequently in sight; and occasionally, upon a level patch, a hamlet of fishermen's homes (Fig. 115) is seen. These hamlets are usually upon the deltas of small streams and are connected with the outer world, and with other villages, by no road or pathway excepting the waters of the fjord. So isolated are these hamlets that each man must learn to do many things, — farm, fish, tan his leather, make his shoes, build his boat, his house, and many other kinds of work.



FIG. 176.

Hammerfest, Norway, far within the Arctic circle. This town is the nearest to the pole of any in the world excepting Upernivik in Greenland, where all but a few of the inhabitants are Eskimos.

Hundreds of visitors from all parts of the world travel by steamer along this coast every summer to enjoy the beautiful scenery. Another attraction is the sight of the sun at midnight (Fig. 175). At Bergen, Christiania, and Stockholm, which are in nearly the same latitude, the shortest night is

less than six hours; at Trondhjem it is about four; and at Hammerfest (Fig. 176), far within the Arctic Circle and near North Cape (Fig. 175), the sun does not set from May 13 to July 29.

Industries and Cities of Sweden.—Agriculture is the leading industry of Sweden, for fertile soil, swept by the glacier (Fig. 114) from the northern and western highlands, has been scattered over the lower lands. In consequence, the southern part of the country presents much the same appearance as New England. Oats are raised in most abundance, but rye, barley, wheat, and potatoes are also produced in large quantities. One reason why these products can mature here is the absence of cool summer winds from the ocean; another is the great length of the summer days in this far northern latitude. Much live stock is also raised, and butter is exported to Great Britain.

However, nearly one-half the area of Sweden is covered with forest, and lumber is by far the greatest article of export, as in Norway. Indeed, these two countries supply much of the lumber needed in western Europe. Their wood is especially valued because of its hardness and durability—qualities that are due to the closeness of the annual rings caused by the shortness of the summer season.

Mining is the third important industry. There are silver, lead, zinc, and copper mines. Some coal is found in the southern end, and the country has long been noted for its excellent iron ore. But since the principal iron mines are located far from the coal, there is little iron manufacturing in Sweden. However, as in portions of the Lake Superior district of the United States, some of the iron ore is smelted by the use of charcoal, and some by coal mined in Sweden or brought from other countries.

The Swedish iron is of such excellent quality that it is eagerly sought where the highest grade of steel tools is manufactured, as in Sheffield, England.

Sweden possesses excellent water power for various kinds

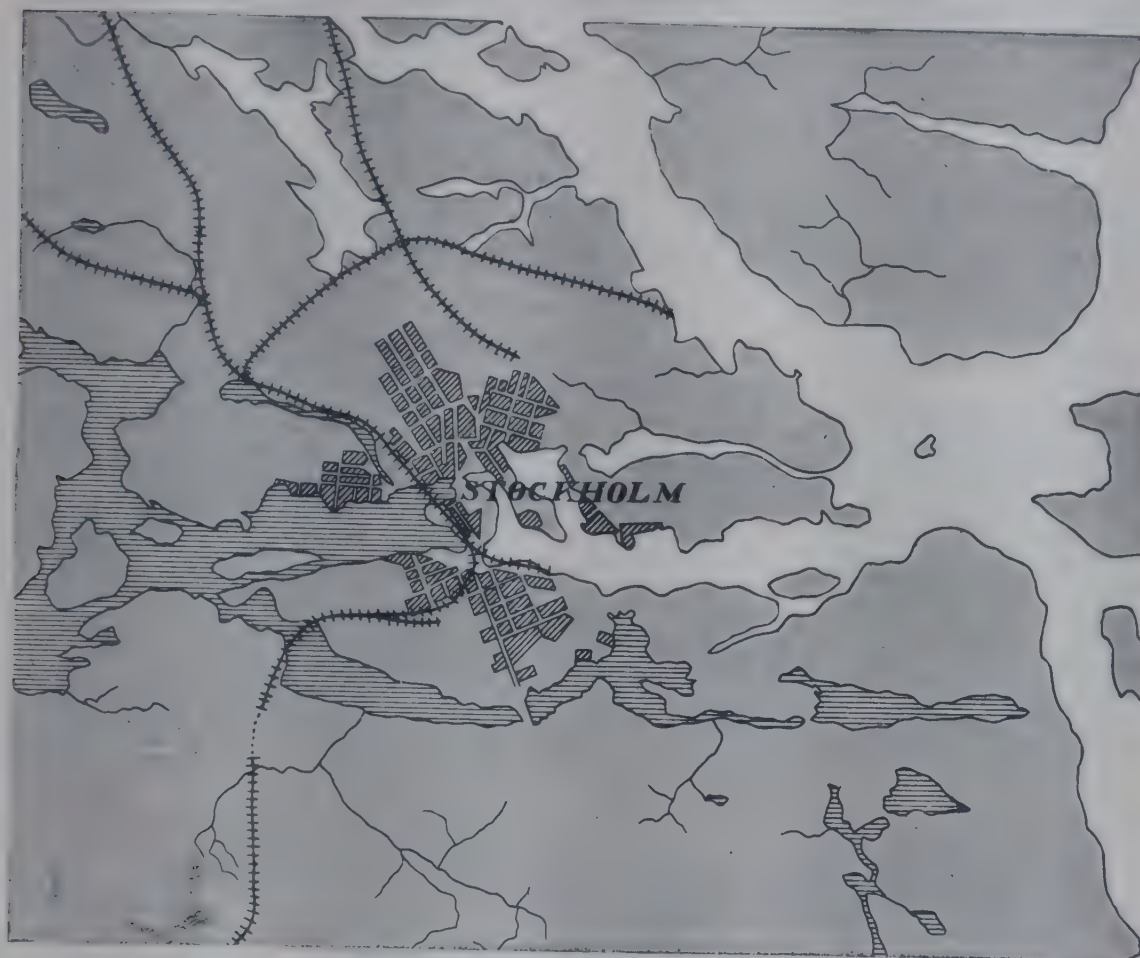


FIG. 177.

To show the location of Stockholm, with branching arms of the sea on one side and lakes (shaded), caused by glacial deposits, on the other.

of manufacturing, and in recent years the numerous rivers have begun to be utilized, so that manufacturing is making rapid progress there.

The two principal cities — STOCKHOLM, the capital, and GOTHENBURG — are on the coast; but there are other small seaports and inland mining towns. Stockholm is the resi-

dence of the king of the united countries, who is also required to spend a part of each year in Norway. The situation of this city is one of marvellous beauty, on an excellent harbor (Fig. 177); but unfortunately it is blocked with ice for four months each year. Owing to the numerous lakes (Fig. 177) and to canals, it is connected by water, as well as by rail, with the chief points



FIG. 178.

The royal palace at Stockholm.

in a populous region, and is therefore the principal distributing centre for imports. Gothenburg, the chief centre for exports, possesses the important advantage that its harbor is seldom frozen over. It is connected with Stockholm by railway as well as by lake and canal. Much of the distance between these two cities is occupied by lakes.

The principal foreign trade of both Norway and Sweden is with Great Britain. Give reasons for this. What must be the main articles of import and export? Next to Great Britain comes Germany. Can you suggest reasons for this?

Industries and Cities of Denmark. — There is neither coal nor metal in the rocks of Denmark, so that there is no mining in the country. The only mineral product of value is clay, well suited to the manufacture of porcelain, which is an important industry. As in Ireland, the lack of coal for fuel is partially met by peat from the bogs and swamps of the northern and western parts.

The fact that butter constitutes one-half the exports of Denmark throws much light upon the principal occupation of the people. Farming, especially dairying, is the chief industry; and in this small country there are a million and a half dairy cows and nearly as many sheep, besides many horses, goats, and pigs. The laws of the nation discourage large farms, so that each farmer, by carefully cultivating a small patch of land, as in Belgium, obtains the most that it can yield.

The nearness to good fishing banks has naturally made fishing important; and this, together with the influence of island life, has created such a love for the sea that large numbers of Danes serve as sailors on British and other foreign vessels.



FIG. 179.

A view in Copenhagen.

As in the case of Norway and Sweden, the principal foreign trade of Denmark is with Great Britain. Why? What goods

can well be exchanged? One might therefore expect an important seaport on the western coast; but that coast is so low, and so shut in by sand bars, that good harbors are lacking. In fact, the only harbor in all Denmark that admits large vessels is COPENHAGEN (merchants' harbor) on Seeland Island. The shipping, therefore, is centred at that port. And since this point guards the entrance to the Baltic Sea, there is a double reason why Copenhagen is the principal city of Denmark. The fact that it is the capital also increases its importance. While it approaches Buffalo in size, the next largest city is only one-tenth as populous.

Colonies of Denmark. — The Danes, even more than the Norwegians, have been daring seamen and explorers of foreign lands. Although some of their possessions have been lost, Greenland, the Faroe Islands, and three small West Indian Islands are still Danish colonies; and Iceland is a Danish dependency. In the *Faroes*, consisting of a score of small islands north of Scotland, the principal products are sheep and fish. Why might you expect these two particularly?

Iceland, which is larger than Ireland, and more than twice the size of Denmark, is an island of volcanic origin. Over a hundred volcanoes are found there, twenty-five of which have been in eruption during historic times. Mt. Hecla is one of the most noted of these. Destructive earthquakes are common, and there are also geysers similar to those found in our Yellowstone National Park.

The interior is a desert plateau, for the most part covered with snow, and hence uninhabited. Near the sea, however, there is some good pasture land, and the people are principally engaged in raising cattle and sheep. Fishing is important, and down from the eider duck is a valuable product. Sea-birds, which abound, are one of the principal sources of food.

REVIEW QUESTIONS. — (1) What about the people of these three countries? (2) What about their government? (3) How have they been related to our history? (4) Mention some geographic facts that have helped to preserve their independence. (5) Describe briefly the surface of Norway; of Sweden; of Denmark. (6) Where are the principal farming sections? (7) Tell about agriculture in Norway. (8) Why is there little manufacturing there? (9) What is the principal export? Why? (10) What about fishing? (11) Give reasons for the large merchant fleet of Norway. (12) Tell about the cities of Norway. (13) Describe the scenery on the western coast. (14) Tell about Sweden: the principal industry; the forests; the mining; the manufacturing; the principal cities. (15) What are the principal industries in Denmark? (16) Where are the harbors? (17) Tell about Copenhagen. (18) Tell about the foreign territory of Denmark. (19) What are the important facts about Iceland? (20) Give some reasons why Norway, Sweden, and Denmark have their principal foreign trade with the British Isles.

SUGGESTIONS. — (1) Why should the telephone prove of special importance among the fishing towns scattered along the coast of Norway? (2) By use of a globe explain why the sun need not set for weeks at a time at Hammerfest. (3) Why is the whale and seal fishing important as a means of furnishing light during the long night of this northern land? (4) What do you know about the life of the Laplanders? (5) Why should Bergen be one of the rainiest cities of Europe? (6) Give reasons why harbors on the Baltic should be blocked by ice much oftener than those on the western coast of Norway. (7) Have you ever seen Swedish matches? Can you give a reason why so many matches should be made in that country? (8) Give all the reasons you can to explain why the Norsemen should have become such daring navigators. (9) Hans Christian Andersen was a native of Denmark. What stories do you know that were written by him? (10) Read and retell stories of the Norse gods in old-time mythology. (11) Read parts of *The Saga of King Olaf*, a poem by Longfellow.

XV. RUSSIA

MAP QUESTIONS (Fig. 172).— (1) About how much of Europe is included in Russia? (2) What part of the distance from pole to equator is included? (3) What does this suggest concerning temperature and rainfall? (4) How much of the boundary of Russia is sea coast? (5) Name the seas which border it. (6) Name the mountains on or near the border. (7) What portion of Russia is occupied by plains? (Fig. 109). (8) In what directions do the large rivers flow? Name the three longest. (9) What peculiar fact do you notice about the Caspian Sea? (10) Find Poland, Finland, and Lapland. (11) What parts of Asia are in the Russian Empire? (Fig. 241).

Size and Position. — Russia in Europe is larger than all the other European countries together; and the Russian Empire, which includes Siberia and other lands in Asia, occupies about one-sixth of all the land upon the globe. The empire extends from the Baltic on the west to the Pacific on the east, and within its borders is included a great variety of climate. What countries in North and South America approach it in area? In variety of climate?

In spite of its vast extent, the development of Russia is greatly hindered by the lack of good harbors. In this respect it contrasts strongly with the United States. To be sure, the sea forms a large portion of the Russian boundary; but ARCHANGEL, the principal port on the White Sea, is icebound for nine months, and the Baltic ports for four or five months each year. Besides this, the entrances to the Baltic (p. 252) and Black seas are guarded by foreign nations. Why are the Caspian ports of little use?

Physiography. — Most of the large rivers in western Europe have their sources in the mountains. Give examples (Fig. 109). It is not so, however, in Russia where the central divide is a low, hilly region less than twelve hundred feet above sea level at its highest point. Aside from the mountains along the border this is the highest part of Russia. How does it compare in altitude with the highest point in flat Holland? (p. 209).

From what has been said, it is evident that most of Russia is a remarkably level plain (see also Fig. 109). Since several of the rivers are very long, what must be true as to the velocity of their currents? What must follow as to their value for navigation? What about the ease of canal construction?

In southeastern Russia, on the other hand, are the lofty Caucasus Mountains (Fig. 110), in which one of the peaks, the extinct volcano, Mt. Elbruz, is the highest mountain in Europe. But at the very base of these mountains are broad plains which in places are even lower than the level of the sea.

The Caspian Sea, into which the longest river of Europe pours its floods, is the largest inland sea in the world. It was formerly much larger than now; in fact, ocean water once reached from the Black Sea, across Siberia, to the Arctic. Changes in the earth's crust have raised much of this ocean bottom above sea level and left large inland seas in the depressions. But, in spite of the enormous volume of water which enters these inland seas, the evaporation in that dry climate has caused them so to shrink in size that neither the Caspian nor the Aral Sea (Fig. 241) is now connected with the ocean. The surface of the Caspian is now eighty-five feet below sea level, and by evaporation it is steadily growing smaller and saltier, leaving broad, salt-covered plains round about it.

Climate. — The influence of distance from the ocean upon temperature and rainfall is well illustrated in Russia. Moscow is in the same latitude as Edinburgh; but while at Edinburgh the average temperature for January is 37° , at Moscow it is nearly 25° colder (Fig. 117). Notice which summer isotherms pass nearest to these two cities. It was the severity of the Russian winter that caused Napoleon Bonaparte to lose nearly the whole of a great army when he was invading that country in 1812. What effect must this cold have upon navigation of the rivers?

Extreme drought, as well as extremes of temperature, are found in parts of eastern Russia. Although the rain-bearing winds meet with no barrier in sweeping over such level land, they nevertheless deposit so much moisture on the countries of western Europe that no part of Russia has heavy rainfall; and the eastern part averages less than twenty inches per year (Fig. 118). Since this amount is barely sufficient for agriculture, the crops suffer, and famines follow in especially dry seasons. Southeastern Russia is altogether too arid for farming, being not only far from the ocean, but so far south that it is not greatly influenced by the prevailing westerlies.

Climatic Belts. — Russia may be divided into several belts, according to climate. In the north are the frozen *tundras*, even in summer too cold for agriculture. The scattered Laplanders, who are able to live in the far north, have habits resembling the Eskimos (Fig. 180). They have, however, domesticated the reindeer (Fig. 121), which feeds on moss and is therefore able to live farther north than sheep, cattle, and horses. Without this animal most of the Lapps could not exist in this bleak region.

South of the tundras, the warmer climate permits the growth of *forests*, including such trees as pine, fir, oak, beech,

and birch. Some of this timber has been cut away, and farms have taken the place of forest; but much woodland still remains.

The forest belt is gradually replaced on the south by open, grass-covered plains similar to those of central and western United States. This is the best agricultural belt of Russia, where grains are raised in enormous quantities, especially in the "black earth" belt, where the soil is fine-



FIG. 180.

A Laplander's hut. The home of the Laplanders is in northern Scandinavia and northwestern Russia.

grained, black, and very fertile. The climate of the grassy plains gradually becomes more arid toward the south and east, until on the steppes farming is impossible. There herding is the main industry, as in the arid section of the United States. Both on the steppes and in the forest belt the summers are warm and the winters cold and accompanied by icy winds which sweep over the plains from the north.

In the extreme southern part of Russia, near the Caucasus Mountains, there is abundant rainfall; and, being so far south, the crops of warm temperate climates are raised (p. 270). But around the Caspian Sea most of the land is a desert.

People and Government. — The plains of Russia have offered no better barrier to the inroads of invaders than to the winds. We therefore find many kinds of people united under Russian rule. Most of these belong to the

white race, but to a different division from the German and British peoples. The Russians are *Slavs*, originally from Asia; while the inhabitants of Germany, Scandi-



FIG. 181.

A Lapp boy from Lapland in Russia.

navia, and the British Isles are of the *Teutonic* division. But Russia also contains many Jews, Teutons, and other people, including the Lapps (Figs. 180 and 181) and Finns who are classed with the Mongolian race. All together not less than forty languages are spoken within the realm.

In former centuries, while other parts of Europe were advancing in civilization, Russia was being raided by outsiders and its progress retarded by conquest. The country was so remote from west-

ern Europe that it felt little influence from the growing civilization of the west. Moreover, approach by water was then difficult, because formerly the only Russian sea-coast was on the Arctic. It was not until the time of Peter the Great (1682-1725) that Russia began to learn the lessons of civilization from other European nations.

These facts help to explain why Russia is so slightly advanced in some directions. While the common people of other European nations were demanding greater liberty, and were constantly acquiring education, the mass of the Russians

were kept in subjection and ignorance. They were mere *serfs*, who were little better than slaves to their lords, the nobles. Although the serfs were liberated in the middle of the last century, almost no attempt has been made to educate the masses, and at present they possess little liberty.

The emperor, or *Czar*, is an absolute monarch "whose will alone is law." On purely local matters, however, the peasants have a voice. Those of a locality meet in a *Mir*, or assembly, to discuss matters of common interest and to elect officers from their number, somewhat as is done in town-meetings in the United States. Naturally, in this day of popular government, many of the people are dissatisfied, and it is on account of this discontent that attempts are made to assassinate the Czar. The attack is against the *form* of government, rather than against the Czar, who personally is usually an estimable man.

Lumbering. — Nearly a third of European Russia is forest-covered, and the timber resources, as in Norway (p. 254), are among the greatest of the country. This forest supplies not only lumber, but pulp for paper and bark for tanning. Many fur-bearing animals live in the forest, as was formerly the case in other parts of Europe.

Farming and Grazing. — Both in the forest region and on the open plains to the south, there is extensive agriculture. Fully nine-tenths of the people are supported by farming, which makes Russia primarily an agricultural country.

The most important crops are the grains, especially rye, wheat, barley, and oats. Russia ranks next to the United States among grain-producing countries, and wheat is one of its principal exports. Another important crop is hay; and potatoes, sugar beets, and flax are extensively raised in the cool temperate climate.

In southern Russia the warm climate permits the culture of grapes, tobacco, and corn; and south of the Caucasus even olives and cotton are produced.



FIG. 182.

A fisherman's house in Finland. Fishing is a very important industry in Russian waters; and there is a great demand for fish owing to the number of fast days kept by the Greek Church, to which the majority of Russians belong.

Farming in Russia is very crudely done, as might be expected from the character of the people. Aside from old-fashioned implements, their roads, which are a fair index to the development of a nation, are extremely bad. The level nature of the land makes this of

little importance in dry weather; but in wet seasons the roads become so impassable that crops cannot be carried to market. Undoubtedly the farm products in southern Russia would be far more extensive if good roads were provided. This may be said also of some parts of the United States.

On the grazing lands of the arid steppes, which resemble our western plains, many sheep, cattle, and horses are raised. The nomadic herdsmen, such as the *Cossacks*, still retain many of the customs of the shepherds and herders of Bible times, who dwelt farther south in Asia.

Mineral Wealth. — Some parts of Russia contain mineral deposits of great value. In the Ural Mountains, for example, are gold, silver, copper, platinum, and other metals, besides some precious stones and graphite, or "black lead," which is used in lead pencils.

Coal and iron are mined in several parts of Russia (Fig. 113), and each year the amount is increasing. As in Great Britain, some of the iron ore is so near coal and limestone that it is easily smelted.

Russia ranks next to the United States in the production of petroleum. In our own country this oil was found to be remarkably abundant in western Pennsylvania, eastern Ohio, and West Virginia. The Russian petroleum is also found in several places, especially at BAKU on the Caspian. But since its quality is not as good as that of the United States, it is less useful for kerosene. Large quantities are therefore consumed as fuel for steamers on the Caspian and Volga; and, as in southern California, the oil is also used in locomotives.

Manufacturing. — Although numerous factories have recently been established in Russia, about six-sevenths of the manufacturing population carry on the work by hand in their own homes. What a contrast to the United States and to Great Britain!

Distilling and brewing are the principal forms of manufacturing not done in the homes; then come cotton manufacturing and sugar refining, while flour mills, woollen and linen factories, and iron works follow. What raw products of Russia encourage these industries?

PRINCIPAL CITIES AND THEIR COMMERCE

Moscow and Nijni Novgorod. — The former isolation of Russia from other countries is illustrated by the fact that the principal cities were for a long time situated far in the interior. For example, Moscow, the second city in size and one of the chief manufacturing centres, and once the capital of the empire, is located almost in the centre of the realm, as Madrid is in Spain. The point was well chosen, because rivers, which canals could easily connect, diverge from this section in all directions. By the introduction

of railways the advantage of this location was so increased that Moscow is now the great railway centre of Russia, as Madrid is of Spain, and for the same reason. State this reason (p. 245). But the land about the city, unlike that around Madrid, is fertile and densely populated.



FIG. 183.

A view of Moscow. Notice how very level the country is.

Not only is Moscow adorned with royal palaces and government buildings, but it is the holy city of Russia, and therefore has numerous convents and churches (Fig. 184). The University of Moscow, the largest in the empire, is attended by nearly four thousand students.

East of Moscow, on the Volga River, is NIJNI NOVGOROD, renowned for its annual fairs. A great trade centre is needed somewhere in this region for the exchange of Asiatic and

of Russian products, and this city is suitable for the purpose because of its superior water connections. Point them out (Map, Fig. 172). The fairs, held in August and September, are the greatest in Europe, and attract as many as two hundred thousand strangers annually. In a single season goods are exchanged to the value of nearly \$200,000,000, and

prices are fixed on crops and other materials for the coming year. Why could not such a centre for trade be better located upon the Caspian Sea?

St. Petersburg.— While the two cities just described are very old, their position in the interior is not well adapted for communication with distant nations. It was this fact which led Peter the Great, in 1703, to found St. Petersburg at the head of the Gulf of Finland. The site selected is very marshy, and the climate is cold, foggy, and unhealthful. Moreover, the arm of the sea on which the city is situated is so shallow that a ship canal twenty miles in length has been necessary to connect it with the deeper water farther west. In addition, the



FIG. 184.
Greek Church at Moscow.

harbor is ice-bound for more than four months each year.

Yet in spite of all these disadvantages, St. Petersburg is already the largest city in Russia, and the fifth in size in Europe — facts that show how much such a seaport was needed. It is also one of the most magnificent of cities, having especially wide streets, splendid public buildings,



FIG. 185.

St. Isaac's Church in St. Petersburg.

and fine residences. More goods are shipped by this route than from any other Baltic port, RIGA, to the southwest, having about half as much shipping.

Odessa. — Odessa, another important port, was founded a little over a century ago when Russia obtained possession of the northwestern coast of the Black Sea. Since the harbor is rarely frozen over for more than a few days, it possesses a great advantage over St. Petersburg, which it equals in its shipping trade. Besides being the chief outlet for the vast grain trade of southern Russia,

and the principal port on the Black Sea, Odessa is an important flour-milling centre, like Minneapolis.

Warsaw and Lodz.— Thus far the Russians have found no opportunity to obtain possession of Constantinople, although they have, no doubt, felt many a yearning in that direction. Why? But their progress in the west has not been confined to the establishment of seaports. They have extended their territory in various directions, one of their most important ac-



FIG. 186.

A view of Helsingfors in Finland.

quisitions being a part of *Poland*, in which are situated two of the leading cities of Russia, — WARSAW and LODZ. The former is a centre for the railways that connect Russia with western Europe, and the latter is a manufacturing centre. Much coal and iron are mined in this vicinity.

Finland, whose capital is HELSINGFORS (Fig. 186), although a part of the Russian Empire, has a measure of independence. There is a parliament which makes laws, but the Czar has the right of veto. Unlike the Russians, most of whom belong to the Greek Church, the Finns are mostly Protestants, belonging to the Lutheran Church. Mistreatment by the Russian government has recently led to the migration of many Finns to the United States.

Remembering that Russia owns Siberia also, and has lately been establishing ports on the Pacific coast and building railways to them, it is evident that this is one of the most progressive of European nations. Russia is now one of the six Great Powers, and, with the education of the people and the development of the immense resources, the nation promises to grow rapidly more powerful.

REVIEW QUESTIONS.—(1) Tell about the size of the Russian Empire. (2) What can you say about its position with reference to the sea? (3) Describe its surface features. (4) Tell about the rivers. (5) Tell about the Caspian Sea. (6) How does the climate vary? (7) Describe the climatic belts. (8) Tell about the people. (9) What about the government? (10) Tell about lumbering. (11) What are the principal farm products? What influence have the roads? (12) What about grazing? (13) What mineral products are found? Where? (14) For what purpose is some of the petroleum used? (15) What is the condition of manufacturing? (16) Tell about each of the cities: (a) Moscow—location, comparison with Madrid, importance; (b) Nijni Novgorod—location, fairs; (c) St. Petersburg—location, surroundings, importance; (d) Odessa—location, importance; (e) Warsaw; (f) Lodz. (17) What are the conditions in Finland? (18) What about Russia's future?

SUGGESTIONS.—(1) Compare the area of the Caspian Sea with that of Lake Superior. (2) Read about how the inhabitants of Moscow burned their houses in 1812 rather than give shelter to Napoleon's army. What followed? (3) What must be some of the difficulties connected with building good roads in southern Russia? (4) What did Kosciusko, the Pole, do to make his name memorable to Americans? (5) Have you read the story of Thaddeus of Warsaw? If so, what can you tell about it? (6) Read about how Peter the Great wandered through European countries as a common workman, in order to obtain the benefit of Western ideas. (7) Make a sketch map of Russia, with principal rivers, cities, etc. (8) Compare the area and population of Russia and the United States. Also the degrees of latitude included in the two countries. (9) Where else besides on the Atlantic, Pacific, and Mediterranean does Russia desire an opening to the sea?

XVI. GERMAN EMPIRE

MAP QUESTIONS (Fig. 200 opposite p. 301).—(1) Compare the latitude of Berlin with that of London. (2) Of New York. (3) Estimate the greatest length of Germany from east to west. From north to south. (4) How does it compare in size with the British Isles? Russia? (5) How much of the boundary is natural? (See also Fig. 172.) (6) Point out the principal rivers. To what extent do they correspond in general direction? (7) Is most of the surface plain or mountainous? (Fig. 109). Where are the mountains? (8) What facts do you notice about the coast line? (9) Is the North Sea or the Baltic the more favorable place for seaports? Why?

Extent and Position.—The German Empire contains 209,000 square miles, which is an area a little larger than France and twice the size of Colorado. But it has about 56,000,000 inhabitants, or over a hundred times as many as Colorado and 17,000,000 more than France.

The position of this great nation offers a marked contrast to that of Great Britain. Only about one-third of its boundary is water, while its frontier comes in contact with seven independent countries, aside from Luxemburg. What are their names?

The location of the British Isles is regarded as favorable for world commerce, inasmuch as densely populated Europe lies near at hand on one side, while the far-away New World is on the other side. The situation of Germany possesses great advantages, also. Owing to her central location, most of the markets of the continent are at her very doors, while two of her principal ports, HAMBURG and BREMEN, face Great Britain and the West. On the

map (Fig. 172) find some of the large cities that can be quickly reached from Germany. In these days of railways Germany's central position is superior to that of England for European trade.

People and Government. — It has required a great struggle, which has lasted through centuries, to bring



FIG. 187.

A German peasant girl spinning.

under one rule the various people within the boundary line of the German Empire. In early times north Germany was occupied by men of *Germanic* stock and south Germany by *Celts*, the same races that the Romans found in Britain. The Celts were finally overcome by the Germans, although they have left numerous traces of themselves.

They were dark eyed and dark haired, while the Germanic people were light complexioned; and the former characteristics are to this day common in south Germany. Besides the Celtic and Germanic peoples, *Slavs* and other races from the east settled in early times in the eastern part.

For centuries there was, at best, only a loose confederation to hold these varied peoples together; and the numerous states which occupied the region were often at war with one another and with surrounding nations. Their condition was, in some respects, similar to our own during and immediately following the Revolutionary War. There was, however, one important fact to their disadvantage — their meddlesome neighbors helped to intensify the quarrels that arose among them.

During the war of 1866 Prussia and Austria, the principal kingdoms of the *German Confederation*, strove with each other for the exclusive leadership. Prussia proved successful, and Austria withdrew from the union. Soon afterward, in 1870, the German states, without Austria, joined in a war against France, in which they met with signal victory, taking possession of even Paris itself. In 1871 the new *German Empire*, with its present boundaries, was established.

All together there are twenty-six states within the Empire, some of them being *kingdoms*, some *duchies*, and some merely *free towns*. The smallest of all is the city of BREMEN, occupying only ninety-nine square miles, while Prussia, the largest, contains more than one-half of the entire empire, and has a population of about 32,000,000. They are all united under a central authority, more closely and less independently than our states. In place of a President they have an Emperor (the King of Prussia being by law *Emperor* of Germany), and their form of government is a constitutional monarchy (Fig. 188). However, the power of the Emperor is much greater than that of the British king, though less absolute than that of the Russian Czar.

Defence. — In the war of 1870, the Germans not only defeated the French but compelled them to pay a large sum of money. At the same time they seized the French

territory west of the Rhine, called Alsace-Lorraine, in which Metz and Strassburg are situated. This is a suggestion of the way in which much of Germany's irregular frontier line has been determined. To a great extent mountains form the southern boundary, and water the northern; but the eastern and western limits, largely

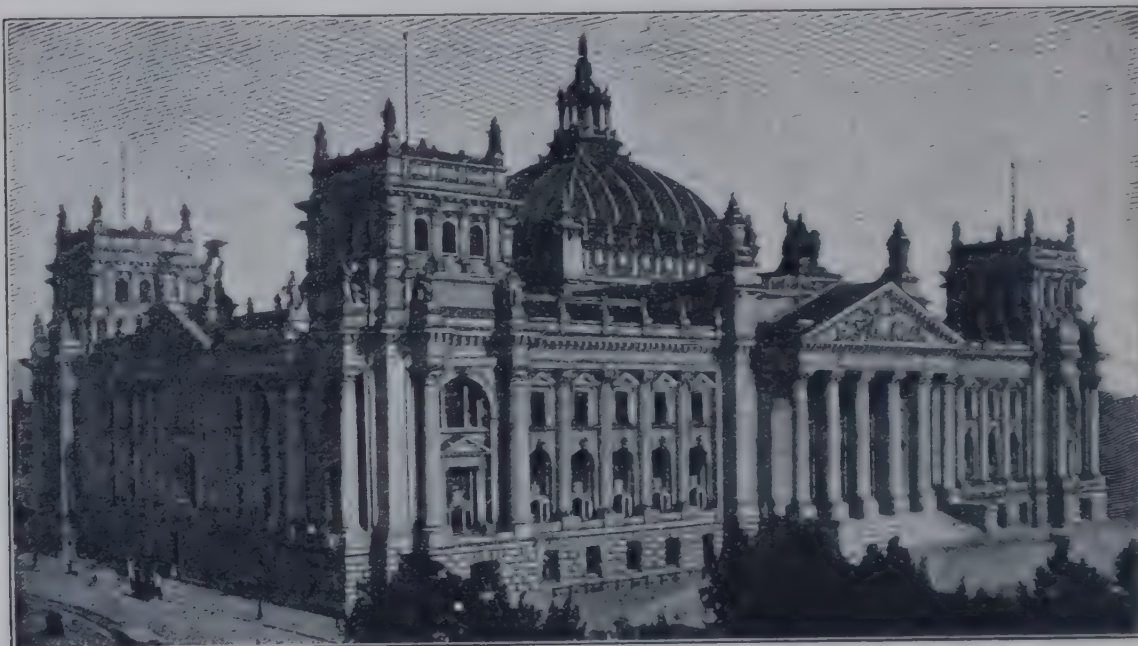


FIG. 188.

The German *Reichstag*, corresponding to our House of Representatives, meets in this building, in Berlin. The other legislative branch, called the *Bundesrath*, is composed of members appointed by the various German states.

decided by war, do not follow any natural barrier. Draw an outline map of Germany.

In order to preserve her present boundaries. Germany must be prepared to defend them at any time. This need calls many citizens to an occupation which we have not thus far considered, namely, that of *preparing for war*.

It is a fact that each of the great European nations is jealously watching the others; and as no one of them knows how soon a dispute may arise with its neighbor, each maintains a large and thoroughly equipped army. The object of each is to

be so dangerous that others may fear to offend or attack it; and if once involved in war, to come off victorious.

For such reasons all able-bodied young men in Germany are required to devote usually two full years and parts of several succeeding years to active military training. Most of them enter the service at about the age of twenty; and as there are about four hundred thousand males arriving at that age every year, one can obtain some idea of what it costs a European nation to have close neighbors. The peace footing of the German army is almost six hundred thousand men, which is larger than the number employed in all the mines of the British Isles. In addition to this, the German navy calls for many recruits. As all these men are, for the time being, withdrawn from industrial pursuits, the nation loses the fruits of their labor for that period. Thus the productiveness of the nation is reduced.

Extensive fortifications are built near the boundary, as at Cologne, Metz, and Strassburg on the French side, and Königsberg and Posen, near Russia. They are also numerous in the neighborhood of the great interior cities, and at strategic points here and there. The expense of these fortifications, and the vast sums required to keep up the army and navy, form a heavy drain upon the nation.

Germany is not unlike the other European nations in these respects. As already stated (p. 203), the British, having no immediate neighbors, rely mainly upon their powerful navy for defence. But every one of the Great Powers is calling for many men, and expending large sums of money either for the army or navy, or both. In fact, preparation for war is one of the great occupations of Europe to-day.

Physiography. — Germany consists of two quite different parts. The southern section is mainly a mountainous region of ancient date, and therefore worn low (Fig. 189), like the mountains of Great Britain and New England. It is, in fact, a plateau from one to two thousand feet

in height, with some ranges, like the Erzgebirge, rising high enough to be commonly classed as mountains. Only in the extreme south, on the edge of the Alps, is a great altitude reached, one peak being nearly ten thousand feet above sea level.

Valuable minerals have been revealed by the wearing away of these ancient mountains; indeed, the mineral



FIG. 189.

The city of Stuttgart in the low plateau of ancient mountain land of southern Germany.

belt of southern Belgium and northeastern France is but a continuation of the highlands which cross southern and central Germany.

Northern Germany is a lowland, broadening toward the east until it merges into the plains of Russia. In the neighborhood of Holland the plain is very low and flat (Fig. 190); but in most places, owing to the irregular deposits left by the Scandinavian glaciers, it is rolling.

Elevations in this part of Germany rarely exceed six hundred feet. This plain is, in large part, included in Prussia, the greatest and most powerful of the German kingdoms.

Most of the drainage is northward into the North and Baltic seas. What river rises in the highland region of southern Germany and crosses Austria, finally to enter the Black Sea? Name and trace the courses of four large rivers which flow northward. Of these the Rhine is the most important. Notice the large number of cities along its banks. While parts of the Rhine valley are broad and densely settled, the river in the central part of its course flows through a deep and beautiful gorge cut in the highlands (p. 297).



FIG. 190.

A view on the very level plain of north Germany.

Climate. — The average yearly rainfall is about twenty-eight inches, although the amount decreases toward the east until, near the Russian border, it does not exceed twenty inches. That these figures may be better appreciated, we may recall the fact that the average rainfall in most parts of the United States east of the Mississippi River is over forty inches.

Note the number of degrees of latitude included in Germany. Nevertheless, owing to the difference in elevation, the southern plateau is about as cold in winter

as the northern lowland. Notice (Fig. 117) that the winter isotherms extend nearly north across Germany. In summer, however, the southern part is warmer than the northern. But the valleys of the south, being low and enclosed, are warmer than the northern plains both in winter and in summer, and are therefore capable of producing such crops as tobacco and grapes.

The increase in extremes of temperature toward the east, or away from the ocean, is illustrated on the coast. The North Sea is almost free from ice, while the Baltic ports are frozen over for a time; and the farther east they lie, the longer their trade is arrested by the cold. What must be some of the results of this fact?

Forests. — That the mountains of Germany are low enough to be well wooded, is indicated by the frequent use of the word *wald* (the German for wood) in the mountain names. Where the soil is poor, as in the stretches of sand deposited during the Ice Age, much of the lowland is also wooded. All together about one-fourth of the surface of the empire is covered with trees.

The tendency of the German people to useful and sensible economy is well illustrated in their treatment of the woodlands. Instead of wantonly devastating them by fire and the axe — as has been done in so many parts of our own country — they maintain an excellent system of forest culture. Trees are planted in place of those that are cut for timber, these are given proper care, and thus the woods continue to be abundant. By this system, also, forest culture becomes profitable. It is partly due to the encouragement received from the success in Germany, that forest reservations have been established in various parts of the United States, and schools of forestry founded, as in New York, for the purpose of studying how to care properly for our woods.

Agriculture and Grazing. — On the whole, Germany has not a fertile soil ; but the farm products are very extensive, because the people are both industrious and intelligent, and their method of cultivating the soil is excellent. What countries may well be contrasted with them in this respect?

More than one-third of the population are dependent for their living upon agriculture, the leading



FIG. 191.

A view on the Rhine at Bingen. Notice the opposite bank where the earth has been terraced so that even the hill slope may be used for vineyards.

industry of the nation. Germany is one of the most important grain-producing countries of Europe ; but here rye replaces wheat as the principal grain. Potatoes, introduced from America, are raised in such quantities that, like rye, they form one of the principal foods. These two crops are extensively cultivated, both because they are a cheap food, and because they flourish in the light soil and cool summer climate, characteristic of so

much of Germany. Sugar beets, hay, oats, and barley are other important crops of the northern plains, while in the Rhine and other warm, sheltered valleys of the south, hops, tobacco, and grapes are raised in large quantities.

Since much of the lowland is too sandy for cultivation, and much of the highland too rugged, it is not surprising that one-sixth of all the surface consists of natural pasture. Cattle for beef and for dairy purposes are kept in nearly all parts of the empire, but especially in the damper climate of the west. Contrary to the condition in most countries, sheep are less numerous than cattle. The number of sheep is decreasing because wool may be so cheaply imported; but swine have greatly increased, largely because of the cheap food supplied by refuse from the beet sugar factories, which have been increasing in number (p. 288).

Mining.—Next to Great Britain, Germany is the greatest mining country of Europe; and, as in the United Kingdom, her most valuable minerals, coal and iron, often occur in the same region. Germany and Belgium together produce more zinc than all the rest of the world; and nearly half the silver obtained in Europe is mined in Germany. Much lead and copper also come from Germany.

This country resembles our own in the wide distribution of its coal beds. The coal fields that were found in Belgium and northeastern France (p. 227) extend into Germany in the neighborhood of AACHEN; and from this point eastward to the Russian border there are several important coal fields.

There are also immense salt mines, as at STASSFURT, northwest of Halle, from which are obtained not only table salt, but products used in the manufacture of soap, in dyeing, bleaching, glass making, and calico printing. The Germans employ thoroughly scientific methods in their mining work; and it is from them that other nations have learned many of the methods which are employed in reducing ores to metal.

Manufacturing. — From the above facts we may expect to find Germany a great manufacturing country, with her manufacturing centres well distributed. Explain why.

About a third of the inhabitants are dependent upon manufacturing, and in recent years Germany has so advanced in this industry that she now ranks next to the United Kingdom in the quantity and excellence of her goods.

The distribution of the coal and iron gives the key to the principal centres for iron manufacturing. The busiest section is along the Rhine, in the vicinity of COLOGNE, which may well be compared with northern England in the extent of its industries (p. 188). A second centre is about DRESDEN and CHEMNITZ, and a third at BRESLAU in the southeastern corner of the empire.

As in other countries that we have studied, the textile industries are best developed near the coal fields. Therefore the sections mentioned above are distinguished for cotton, woollen, and silk factories as well as for iron.

The extensive forests partly account for a third occupation of many sections, namely the manufacture of furniture, paper, and other materials made of wood.

An excellent illustration of the fact that the Germans use scientific methods in their manufacturing, as in other industries, is found in their manufacture of dyestuffs. They have discovered how to make dyes from mineral products so cheaply that the expensive vegetable dyes formerly in use have been practically abandoned. This is of importance in the manufacture of various kinds of colored textiles.

The map (Fig. 200) shows no cities south of BRESLAU; yet a busy manufacturing centre exists there. The explanation is that the people carry on this work largely in their own homes, instead of in factories. Living in a hilly country, where agriculture is not very profitable, they spin and weave

the flax and wool raised near by. They also make lace and carve wood; but, although villages stretch for miles along the valleys, there are no large towns.

The manufacture of spirituous liquors is another prominent German industry. A portion of the immense potato crop is made into spirits, and also some of the beets. But beer, in which barley and hops are used, is the common beverage. From the grapes of southern Germany much wine is manufactured, though not nearly so much as in France.

The sugar beet has led to still another noted German industry. The ancient Greeks and Romans knew nothing of sugar, and in fact the people of Europe knew little about it until about two centuries ago. Then they began to import sugar from countries whose hot, moist climate and fertile soil were favorable to the cultivation of sugar cane. At present the leading countries for the production of sugar cane are the West Indies, Java, the lower Mississippi near New Orleans, and the Hawaiian and Philippine islands. In those places the cane is grown for the sake of its sap, which, by boiling, is converted into brown sugar and the by-product, molasses.

For a long time nearly all sugar was obtained from sugar cane, although maple trees supplied a small amount; but German chemists found a means of extracting sugar from beets. By improving the process, and by developing the beets until they contained more sugar, the great industries of sugar beet raising, and the refining of beet root sugar, have been made possible. Each year this source of sugar has been proving a more formidable rival to sugar cane, until now a large part of the sugar consumed in Europe, and even some of that used in North America, is obtained from sugar beets. One important reason why this industry has thrived is that sugar beets grow in a cool temperate climate where population is dense and markets are numerous

Formerly Germany had to rely upon foreigners for sugar, but since the development of this industry, beet sugar has become one of its greatest exports. Nevertheless, the population is so dense and so many are engaged in manufacturing, that, like the British, the Germans cannot raise all the food they need. Therefore much food, such as wheat and meat, as well as raw materials for manufacture, such as cotton, wool, and silk, must come from abroad.

Germany's Rapid Advance. — No European country in the last quarter of a century has experienced such rapid growth as Germany. For example, in the twenty-five years preceding 1895 her increase in popula-

tion was over 11,000,000, while France had an increase of only 2,500,000. The empire has had a corresponding gain in wealth.

Undoubtedly the strong central government established in 1871, and with it the laying aside of the petty jeal-



FIG. 192.

Storks at Strassburg, — a familiar bird in Germany which builds nests on the chimneys.

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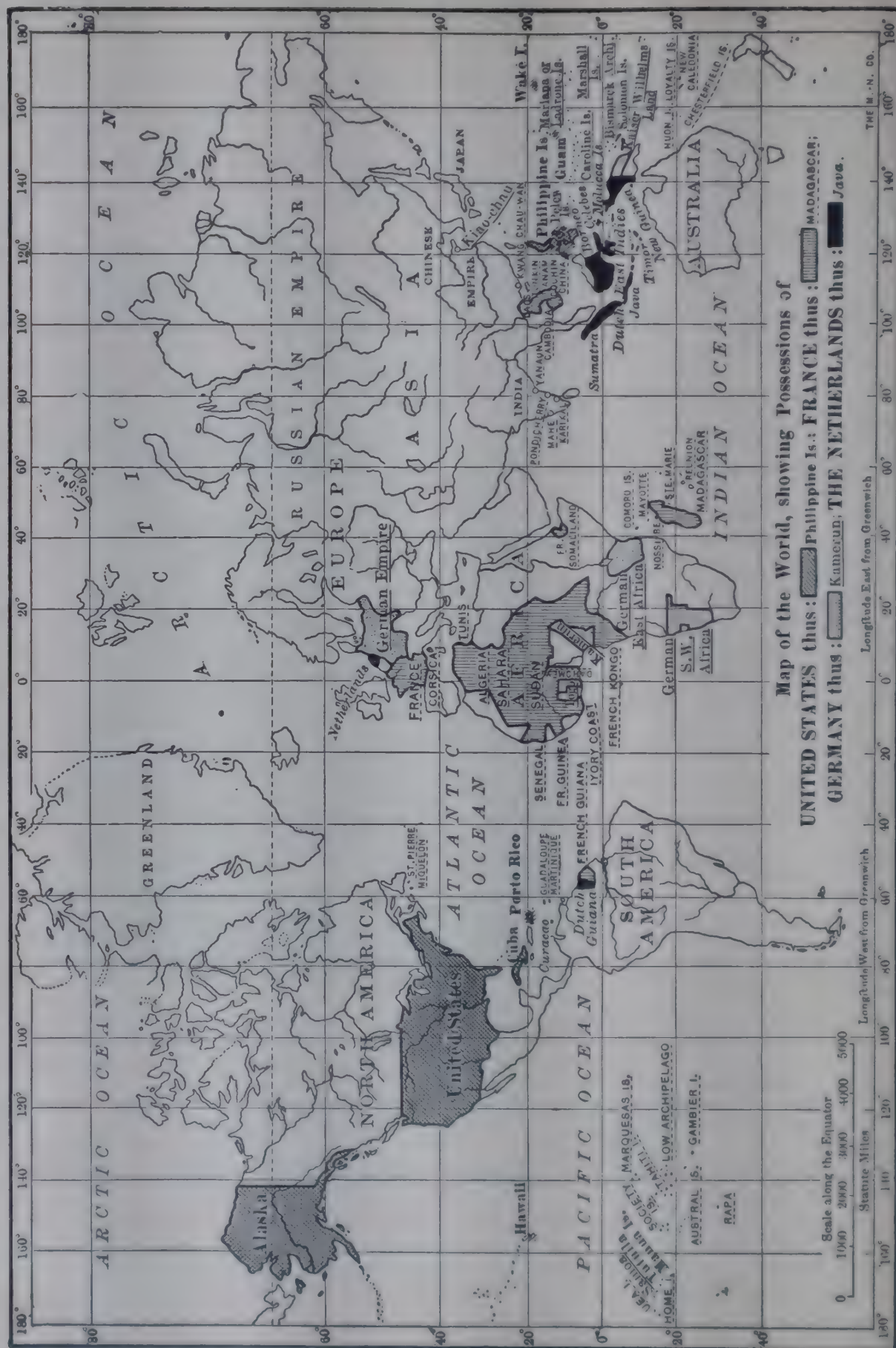


FIG. 193.

Possessions of the United States, France, Germany, and the Netherlands.

ousies that paralyzed industries, is one cause of this advance. But there are many other causes, of which one of the most influential is education and the encouragement of science. Every German child is forced by law to attend school ; and careful attention is given to the study of the various industries, foreign products, languages, etc. In the higher commercial and technical schools, young men obtain excellent preparation for various kinds of business, while in many other countries there is little or no provision for such education.

The value of scientific work is fully recognized and encouraged by the government ; and that such encouragement is profitable to the nation is proved by the wonderful development of the sugar industry, the mines, and the factories. Not many years ago much of the manufacturing was done by hand ; but now the best machinery has been introduced, and Germany is one of the three leading manufacturing nations of the world. Name the other two.

Coupled with the advantage of an excellent education is the fact that Germans live less extravagantly than many people. They economize in their food and their clothing ; for instance, the people as a whole eat the cheap black bread, made of rye, instead of the more expensive wheat bread. Thus they learn to save money, even on a small income ; and this is one of the reasons why Germans prosper in business, both at home and abroad, where others have failed.

The construction of railway tunnels through the Alps, thereby improving communication with the Mediterranean, is another important cause of progress. Explain how.

Colonies and Emigrants. — The recent acquisition of foreign territory is an indication of the growth of Germany. The empire is now in possession of extensive areas in the island of New Guinea, north of Australia, and in both east and west Africa, as well as smaller colonies elsewhere (Fig. 193).

Many Germans have emigrated to various parts of the New World. Fully five million emigrants have come to the United States within the last seventy-five years, while the British Isles have sent us not quite seven million. Naturally many of the German emigrants to other countries have kept up trade with their *fatherland*, and have thereby increased the commerce of Germany.

PRINCIPAL CITIES AND THEIR COMMERCE

After the preceding statements, it may not be surprising to learn that the leading German cities have experienced as rapid a growth as those of America. In the twenty years between 1870 and 1890, for example, Berlin had a more rapid growth than New York, and added as many actual new residents as Chicago. In 1875 Boston had almost a hundred thousand more inhabitants than Hamburg; but now Hamburg has nearly a hundred and fifty thousand more than Boston. Other German cities have increased, and are still increasing, in population at much the same rate.

Berlin. — The position of Berlin, on a small river (Fig. 196) on the North German plain, midway between the coast and the highlands, may not at first seem advantageous. But the Oder and some of the tributaries of the Elbe approach so near each other in this section that they have easily been united by canal. Thus Berlin has water connection with both HAMBURG and STETTIN, as well as with all parts of these two river systems, — a very important aid in obtaining fuel, food, etc., for the city. Observe also (Fig. 200) that Berlin lies on the direct route from Hamburg to Breslau, and from Stettin to Leipzig, and that other large cities surround it. It is, moreover, on the

route of several great European railways, and is therefore one of the important railway centres of the continent.

With such excellent connections, by water and by rail, Berlin has naturally become one of the great manufacturing cities. Fully half the residents are supported by this industry, which includes brewing, the manufacture of fancy



FIG. 194.

The Dresden Art Museum.

articles, clothing, machinery, etc. Besides being the capital of Prussia and of the German Empire, Berlin is the centre of German banking. It is noted for its art and music, and for its great university, the largest in the empire. There are a number of suburbs, one being POTSDAM (Fig. 196), the German "Versailles," in which are located several royal palaces.

Interior Cities near Berlin. — Among the cities not far from Berlin is LEIPZIG, the fourth largest in the empire. It is situated at the junction of two small streams at a point where roads from the highland meet those from the lowland. Formerly it was a centre for wagon roads, and now it has naturally become a railway centre. Owing to its favorable position, Leipzig is, next to Berlin, the



FIG. 195.

A German residence.

most important trade centre of Germany. One of its leading articles of commerce is fur. It is the seat of a noted university, and a centre for the German book-trade.

DRESDEN, southeast of Leipzig, is noted for its art museum (Fig. 194), which rivals the Louvre of Paris. The

beautiful Dresden china is made in this vicinity, and in recent years much manufacturing has developed, for Dresden is situated on a navigable river and has coal near at hand. It is, moreover, the capital of Saxony, the most densely settled German state.



FIG. 196
Berlin and vicinity.

CHEMNITZ, near by, has important textile industries; and HALLE and MAGDEBURG, farther to the northwest, and in the centre of the chief beet-growing area, are extensively engaged in the manufacture of sugar.

BRESLAU, only a little smaller than Leipzig, is on a navigable river, and has the advantage of being near a very rich



FIG. 197.

A castle on the Rhine.

coal and iron field. It is, therefore, a great manufacturing city, and its situation near the frontier makes it an important market for eastern and central Europe.

Seaports. —

HAMBURG, which is larger than St. Louis, is the second

city in Germany, and the most important seaport on the continent. The reasons for this are clear when it is known that the estuary of the Elbe (Fig. 196) makes an excellent harbor, usually free from ice, and that Germany has an extensive foreign trade. Name some articles which that port probably receives from the United States. What water connections has Hamburg with the interior?

BREMEN and STETTIN also admit large vessels, and are the chief rivals of Hamburg; but they together have less than one-

half as much commerce as Hamburg. In what respects are they less favorably situated for commerce than Hamburg?

Name other Baltic ports besides Stettin. Which is a natural outlet for wheat from Russian Poland? Estimate the distance saved to the Baltic ports by the construction of the Kaiser Wilhelm canal, which is sixty-one miles in length.

Cities along the Rhine. — The Rhine, the most important river of Germany, is often compared with the Hudson in scenery.

Both rivers have parts that are shut in by high, rocky cliffs, well wooded to the top. But the Rhine is much narrower than the Hudson, so that

these walls seem loftier; and since the stream is more winding, they often stand out boldly, as if in the very path of boats, to bar their further progress. When one journeys



FIG. 198.

The Cologne Cathedral, one of the most beautiful Gothic edifices in the world, was begun in 1248 and completed in 1880.

along the more beautiful portion, a fine old castle — perhaps in ruins, or possibly still kept up as a palatial residence (Fig. 197) — often comes into view, as a turn in the course reveals an especially bold cliff. Frequently one sees several such reminders of the past from a single point on the river. There are many terraced vineyards on the sloping hillsides (Fig. 191), and likewise many a quaint village built on a narrow strip of flood plain between the river and the cliff. Since the Rhine receives more large tributaries than the Hudson, there are more wild glens on the sides and more broad, wooded valleys, which open up charming views from the river.

In regard to the distribution of cities along its banks, the Rhine offers still further contrast to the Hudson. The latter has a large population at only two points; namely, near its mouth, where there are millions of people, and about one hundred and fifty miles to the north, where Albany, Troy, and Cohoes are situated. Between Yonkers (just above New York City) and Albany there is not a city with twenty-five thousand inhabitants. The Rhine, on the other hand, while having no enormous collection of people at any one point, has many populous cities distributed along its course. What have you already learned about Rotterdam at its mouth? How does it compare with New York City in size?

On ascending the river into Germany we come to the great manufacturing region already mentioned (p. 287). What cities do you find there? COLOGNE, the largest, with a population of more than a third of a million, is directly on the river bank. It is a great shipping point, since railways cross the river, and boats from London and other places are able to ascend to this point.

ELBERFELD and BARMEN have important textile manufactories; ESSEN is famous for the Krupp steel works; KREFELD is an important silk manufacturing town; AACHEN (Aix-la-Chapelle in French) manufactures woollen cloth.

Just beyond the great bend in the Rhine is FRANKFORT, on a navigable tributary, the Main, along which lies the easiest route from the Rhine valley to the Danube. Since the railway from the German plain to the upper Rhine passes Frankfort, it is a centre of important trade



FIG. 199.

A scene in Frankfort.

routes, and therefore one of the leading trading and banking centres in western Germany. It has long been a prominent city, and was the capital of the old German Confederation (p. 279).

Railways to the Danube pass through MUNICH, the capital of the kingdom of Bavaria. Although so far to the south, and so distant from coal, Munich is the third city in size in the realm. It is on the trade routes from

Germany to Italy and to Austria, and is accordingly an important railway centre. Much of its renown is due to its art collections and its art industries, such as work in bronze, gold, silver, glass painting, and porcelain manufacturing.

North of Munich, on the road to Berlin, is NUREMBERG, a city widely known for its careful preservation of the old art and architecture that made it famous in former centuries, and for its present manufacture of toys. It is a centre for several railways, and one of the most rapidly growing German cities.

REVIEW QUESTIONS. — Give (1) the area of Germany; (2) the population; (3) the boundaries. (4) What advantage does Germany's position give her for European trade? Tell about (5) the early inhabitants; (6) the government; (7) preparation for war; (8) physiography; (9) rainfall; (10) temperature; (11) forests; (12) agriculture; (13) grazing; (14) mining; (15) manufacturing. (16) Give some of the causes for Germany's recent advance. (17) What about the growth of German cities? Tell (18) about Berlin; (19) cities near Berlin; (20) the seaports. (21) Compare the Rhine with the Hudson. (22) What about cities along its banks? (23) Give reasons for the importance of Munich.

SUGGESTIONS. — (1) Look in an atlas to find in what part of the empire the larger states, such as Prussia, Bavaria, Saxony, etc., are situated. (2) People often assert that the peace of Europe is preserved by extensive preparation for war; in what sense can this be true? (3) What must be some of the benefits of two years of active training in the army, aside from preparation for war? What some of the disadvantages? What relation has this to emigration? (4) What is the size of our standing army? Why so small? (5) What seaports of Europe most nearly approach Hamburg in size? (6) How may the Kaiser Wilhelm canal possibly prove an injury to Hamburg? (7) Show that Germany in her industries resembles Great Britain, while contrasting with Russia and Norway. (8) Find out something about Goethe, Schiller, Humboldt, Emperor William the First, Bismarck, Von Moltke, Wagner, and Schumann. (9) Read about Martin Luther and the German Reformation.

XVII. SWITZERLAND

MAP QUESTIONS (Fig. 200).—(1) What countries surround Switzerland? (2) From which one is it least completely separated by mountains? (3) What large rivers rise among the Alps? In what directions do they flow? (4) Notice the lakes among the Alps. (5) How does the area of Switzerland compare with that of your own state? (6) What reasons can you suggest for so small a nation remaining independent in the midst of powerful countries?

Physiography and Climate.—This is a very mountainous country (Figs. 111 and 203-205), for the Jura Mountains are on the northwestern border, while the Alps occupy the southern half. Between these two mountain systems, which extend northeast and southwest, is a low, hilly plateau, from one to two thousand feet in altitude. About one-third of Switzerland is included in the plateau belt. In so rugged a country one would not expect to find a large population; yet Switzerland is almost as densely settled as France, and much more so than the state of New York.

It is evident that the temperature of this mountainous country must be low, and that it must vary greatly with the altitude. This is well illustrated in the Alps, at whose base are found chestnut and walnut trees, which are replaced higher up by beech, maple, and other trees of the cool temperate zones, and still higher by a belt of evergreens. Above these come dwarfed trees, shrubs, grass, etc.; and higher still, at an average elevation of about nine thousand feet above sea level, the snow line is reached.

The numerous lofty mountains, rising in the path of the prevailing westerlies, cause Switzerland to be one of the wettest



FIG. 201.

A glacier in the Swiss Alps.

countries on the continent. On the higher mountains much snow falls, and, sliding down the mountain sides in the form of avalanches, it gathers in the valleys to produce streams of ice, or *glaciers* (Fig. 201). These move slowly down the valleys until they reach a point below the snow line where the ice melts. They there deposit terminal moraines, which,

though smaller, resemble the moraines made by the continental glaciers of the Ice Age. The Rhone and many other rivers are supplied with water by the melting of the Alpine glaciers.

People and Government. — People who dwell among mountains develop a spirit of independence, as is illustrated by the story of William Tell. Thus we find that, as early as 1291, an agreement was made among a few of the small Swiss states, or *cantons*, for mutual protection against oppression. Many a time since then foreigners

have attempted to conquer the Swiss ; but aided by the difficult approaches to their country, and by the mountain fastnesses to which they could retreat, they have been able to maintain their freedom, although the entire area of the country is only one-third that of Pennsylvania. Their twenty-two cantons, united somewhat as are our own states, now constitute a republic, whose neutrality is guaranteed by the Great Powers of Europe.

But while there is one stable government, there is not one common language. The country is most open toward the north, for the plateau of Switzerland merges into that of Germany. Naturally, therefore, German-speaking people are most abundant, making up 72 per cent of the population. The approach from France is much more difficult, and the French population constitutes only 22 per cent of the whole, while but 5 per cent speak Italian.

Farming. — Owing to the mountainous condition, only one acre in nine is fit for the plough. Yet agriculture is the principal industry. On the lower lands grain, grapes, and the silk-worm are raised, as in the neighboring countries ; and on the lower mountains dairy-farming is important, as might be expected. The population is so dense,



FIG. 202.

A Swiss peasant costume.

however, that much food must be imported, though some products, such as cheese and condensed milk, are exported.

Manufacturing. — Switzerland is very poor in mineral deposits, and coal is entirely lacking. This scarcity of raw materials would suggest that there is little manufacturing, but the inference is false. That the Swiss possess marked mechanical skill is indicated by the remarkable wood carving for which they have long been noted. Like



FIG. 203.

A view of Lake Lucerne. The wall on the left bounds a road which is cut in the rock on the mountain side.

New Englanders, in spite of the absence of coal, cotton, and ore deposits, they have engaged extensively in the manufacture of light articles, such as textile goods, jewelry, etc.

Some other facts, too, are favorable to the Swiss. Owing to the steep slopes, and to the plentiful supply of water from the snow-covered mountains, water power is so abundant that Switzerland is taking a leading place in the use of such power for the generation of electricity.

Also, while nature presents great obstacles to internal

commerce, excellent materials for road building are everywhere present; and Switzerland, unlike Russia, takes pride in its especially fine roads (Fig. 203). Further than that, the commercial position of Switzerland is advantageous, since it is entirely surrounded by densely populated countries which supply raw materials and furnish a market for manufactured goods. The influence of the latter fact upon the cities is very marked.

Leading Cities.

—The largest city, ZURICH, on Lake Zurich, is an important railway centre. The St. Gothard railway, which runs northward from Genoa and Milan, connects

the city with Italy, while other railways bring it in touch with France, Germany, and Austria. These roads are especially important for the introduction of foods and raw materials for manufacture. Therefore Zurich is the centre of one of the principal manufacturing districts,

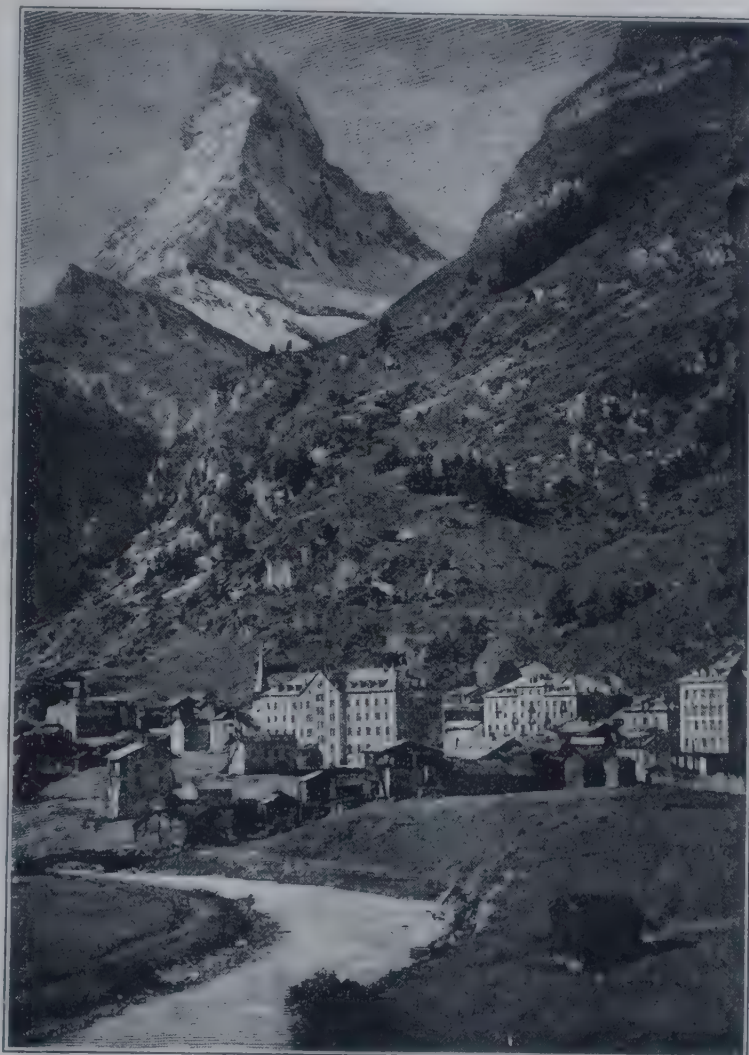


FIG. 204.

The Matterhorn peak, one of the steepest in Switzerland.

and is itself especially noted for the manufacture of silks, cotton, and machinery.

The *St. Gothard Tunnel*, from which the railway takes its name, is the longest tunnel in the world, and is a marvel of engineering skill. Before reaching the main tunnel several smaller ones are entered, through which the train winds in a spiral course, so that once or twice a passenger comes out of the mountain almost directly over the point where he entered it; and in some cases he can see, far below him, two places, one above the other, at which the train entered to follow its spiral course in the mountain rock. This method of construction is rendered necessary because the grade is so steep that a train could not be drawn directly up a straight track. The main tunnel, which is nine and one-fourth miles long, is quite straight. Since silk-making is the chief manufacturing industry in Switzerland, this tunnel, by opening connection with the raw silk market of northern Italy, has greatly aided in its development. The value of such tunnels is further indicated by the fact that, notwithstanding the great expense, another, the *Simplon Tunnel*, is now being built a short distance west of the *St. Gothard*.

BASEL, which, with its suburbs, forms the second centre of population in Switzerland, is the busiest railway point in the country. It is on the main line of the *St. Gothard* railway, and on the Rhine where it enters Germany from Switzerland. Why is its position, near both France and Germany, favorable to manufacturing?

GENEVA, situated on the southwestern end of Lake Geneva, where the Rhone enters France, is a noted educational centre. It is on a very ancient and important trade route from southern France to Germany (p. 235), and therefore has excellent railway connections. Water power is much used in generating electricity for use in manufac-

turing, and the city has long been distinguished for the manufacture of jewellery and scientific instruments.

BERNE, the capital, is centrally located and an important stronghold ; but because it has a less favorable situation for commerce, it is a much smaller city than those mentioned.

These Swiss cities are situated upon the plateau because the climate and soil are more favorable than among the



FIG. 205.

Lake Lucerne.

mountains, and because food and raw materials for manufacture are more easily brought there. Their commerce is extensive, since they import much raw material and pay for it by the export of manufactured goods and dairy products.

Scenery and Tourists. — Many of the Swiss cities are beautifully situated upon lakes, and within sight of mountain peaks always covered by snow. LUCERNE, for example, is surrounded by most beautiful and varied scenery. The city is located

upon the star-shaped Lake Lucerne, and lofty mountains rise in the immediate neighborhood (Figs. 203 and 205). Mt. Rigi is near by, from whose summit one obtains a magnificent view of the lake, bordered by green meadows and numerous villages over four thousand feet below, while in several directions, as far as the eye can reach, are the crests of stupendous, jagged mountains. On account of such scenery Switzerland is the most noted summer resort of Europe, and the entertainment of visitors is one of the leading occupations of the people. There are many hotels and fine roads; and some of the lower mountain tops may be reached by rail. Every summer many Americans cross the ocean to enjoy the Swiss scenery.

REVIEW QUESTIONS. — (1) What are the principal physiographic features? (2) How does the temperature vary? (3) What about the rainfall? (4) Tell about the glaciers. (5) Give reasons why the Swiss have been able to maintain their independence. (6) What about their language? (7) What about raw materials? (8) Give reasons for the development of manufacturing. (9) For what is Zurich important? (10) Tell about the St. Gothard Tunnel. (11) Tell about (a) Basel, (b) Geneva, (c) Berne. (12) Why do so many tourists visit Switzerland?

SUGGESTIONS. — (1) What other factors besides altitude cause great variety of climate in Switzerland? (2) How may the lakes act as filters and regulators for the rivers? (3) The Rhone enters Lake Geneva laden with sediment derived from the glaciers; but it leaves the lake clear of sediment. By such deposits extensive deltas are built in all of the lakes. Of what value is that fact? (4) What special reasons are there for giving particular attention to the study of English and other foreign languages in the Swiss schools? (5) Why has Switzerland, unlike many European countries, not come into possession of colonies? (6) Find the meaning of referendum and popular initiative in Swiss legislation. (7) Why should Switzerland be selected as a place of refuge by persecuted people and political refugees from other nations? (8) Why did Calvin take refuge in Switzerland? (9) Read that portion of the story of William Tell which is supposed to have occurred about Lake Lucerne. (10) Find out about Louis Agassiz: where born; where he later lived; and what he did to establish his explanation of the Great Ice Age.

XVIII. ITALY.

MAP QUESTIONS (Fig. 200). — (1) Of what does the shape of Italy remind you? (2) How does its latitude compare with that of Spain? (3) What neighboring islands belong to it? (4) Point out the principal river. (5) How are the lofty mountains in the north likely to affect the climate? (6) What countries border Italy? (7) What seas border the peninsula? (8) How does its position seem to be advantageous for commerce?

Extent and Position. — Italy is “the very heart of the Mediterranean lands, and plays a great part as a link in the chain of communication between northwestern Europe and the Far East.” For example, mails from London to India go by rail to Brindisi in southeastern Italy, and thence by steamer. What countries in Africa lie nearest to Italy? (Fig. 297). Estimate the distance to them.

The area of Italy, including the islands of Sicily and Sardinia, is only a little greater than that of Colorado, but its population is about 32,000,000. It is the smallest of the six Great Powers, but is the most densely populated of any excepting the United Kingdom. Name the Powers.

People and Government. — The inhabitants of Italy are a mixture of many races. In early times, the central position of the Italian peninsula was of importance in aiding the government at Rome to control the lands bordering on the Mediterranean sea. At that time people from the surrounding lands of Europe, Asia, and Africa were brought to the peninsula, often as slaves captured in war. Later, when

the power of the Roman Empire was weakened, hordes of barbarians invaded Italy. Nevertheless, the permanent settlers have invariably been won over to one language:

and Italian, which is a growth out of the speech of the ancient Romans, is now the universal tongue.

For centuries after the fall of Rome, Italy was broken up into a number of separate and independent kingdoms; but here, as in other countries, the tendency of recent times has been toward unity. In



FIG. 206.

An Italian girl carrying charcoal.

1860 several of the independent states united to form the kingdom of Italy; and later others were added until, in 1870, or about the same time that the German Empire was formed (p. 279), the present kingdom was established with ROME as its capital. Like most of the European countries, Italy is governed by a limited, or constitutional, monarchy.

Physiography and Climate.—The Italian peninsula is mountainous throughout most of its extent. In the north

are the Alps, some of whose highest peaks are on the boundary line between Italy and Switzerland. The Alpine ranges curve around in northwestern Italy and join the Appennines, which extend the entire length of the peninsula and form its very backbone. The principal lowlands, therefore, are the narrow coastal plains and the Po valley.



FIG. 207.

An Italian team at Naples.

We think of Italy as a sunny land of flowers, although Milan and Venice are on nearly the same parallel as Montreal. One reason for the pleasant climate is that the lofty Alps form a great wall which cuts off the cold north winds. Another reason is that the peninsula is under the equalizing influence of the Mediterranean, whose waters have a temperature of over 50° . On these accounts the Italian winters are mild, and in the extreme south the temperature seldom falls to the freezing point.

Much of Italy has an abundance of rain; but, excepting in the north, the greater part comes in winter. The summer drought is due to the fact that the horse latitude belt moves northward in summer (p. 34); therefore southern Italy at that season resembles southern Spain in climate.

Italy has more rainfall than Spain, partly because it is farther north and partly because of the differences in the highlands. Notice (Fig. 172) that while nearly half of Spain is south of the fortieth parallel, only the southern part of Italy reaches below that parallel. Therefore, the influence of the horse latitudes is felt much less in Italy than in Spain. We learned (p. 241) that the highlands of Spain caused the vapor of the ocean winds to condense on their slopes, and that the interior was therefore dry. But the Appennine highlands of Italy are near the centre, and thus cause rain on both sides of the peninsula. The slopes of the Alps likewise influence the rain, causing the heaviest rainfall in the north. Thus in many parts of Italy there is moisture enough for farming.

Agriculture. — Such a climate, together with a fertile soil, helps to explain why agriculture is the principal industry in Italy. Among the products are many that thrive in semi-tropical climates, as well as others that are common in the countries of northern Europe. The climate is so favorable that, by the aid of irrigation, from four to ten crops may be raised in a year.

The most extensive farming district is the Po basin. Long before the dawn of human history this valley was merely an arm of the Adriatic Sea; but as centuries passed, it was partly filled with sediment brought by the many mountain streams. The Po is even now building its delta out into the Adriatic (Fig. 200). By an uplift of the sea bottom this region was finally changed to dry land. How does this history compare with that of the South American plains? (p. 99). These plains of the Po valley are very fertile, and there is an abundance of rainfall; yet the people depend upon irrigation more extensively than in any other part of Europe.

There are several reasons for such extensive irrigation. In the first place the fact that the tributaries have their sources in the mountains, and often in the glaciers and snows of the

Alps, insures a permanent supply of water to the gently sloping land. Besides this, the rivers frequently flow through lakes—some of them among the most beautiful in the world—which act as great reservoirs for water supply.

At one season of the year these streams rise in flood. Explain why. Since the floods would devastate the country unless they were controlled, dikes are common here as in



FIG. 208.

A herd of goats in the streets of Naples. These are driven about the city, and even into the houses, to be milked.

Holland. Diking not only prevents the water from spreading over the plains, but it also checks the rivers from depositing their load of sediment there, as was formerly done. Some of the sediment is therefore left in the river beds, which are thus slowly built up higher and higher. As a result, the dikes must likewise be raised. Hence the lower Po, like the lower Rhine, is higher than the surrounding land.

Where irrigation is so easy, the extensive cultivation of rice is possible. This is an important crop in northern

Italy, but corn and wheat are raised in still greater quantities. Grapes are cultivated to such an extent that Italy ranks second among the wine-producing countries of the world; and so many silk-worms are reared that raw silk is the most valuable export of the country. Among the other important products are eggs, which are exported in large quantities; also olives, oranges, lemons, flax, hemp, and wool.

One great drawback to the proper development of agriculture is the presence of broad, marshy tracts infested with mosquitoes whose bite causes malaria. This is true to such an extent in the southern half of the country, that vast areas have been abandoned, although they are adapted for irrigation and have a fertile soil and a warm climate. It is stated that two-thirds of the railway officials in Sicily are attacked by the fever every summer, and that one-sixth of the entire population of Italy suffers from it. It is not to be wondered at, therefore, that the Italian government is seriously considering what steps may be taken to drain the swamps.

Some of the mountain slopes are also unsuited to agriculture; but they often form excellent pasture land, to which the animals are driven in summer. There are extensive forest tracts under government supervision, as in Germany. Among the important Italian trees is the chestnut, which is planted in groves for the nuts, which are used as a food by the poor.

Mining and Fishing. — The fact that the rocks of the Italian peninsula have been formed in recent geological times accounts for the general absence of valuable minerals. There is a little iron, zinc, and copper ore; but the most important mineral product is the sulphur of Sicily; indeed, until a few years ago this island produced most of the sulphur used in the world. Another important mineral product is marble, of such rare beauty that it is prized the world over.

Fishing is also important; but the fish of the Mediterranean are quite different from those of the North Atlantic. Among

the peculiar products of the sea are precious coral and sponges. You will remember that we found sponge fishing important also among the Bahama Islands east of Florida.

Manufacturing. — As in Switzerland, electricity generated by water power supplies the place of coal to some extent. Consequently there is more manufacturing than one might infer from the lack of fuel. While much raw silk is produced, and there is some silk manufacturing, a large part of the silk is sent to France, Switzerland, and elsewhere, to be made into cloth. There are also factories for woollen, cotton, and flax weaving, and for other purposes.

Most European countries take pride in their fine art galleries; but Italy far surpasses them all and is the very storehouse of art, whether architecture, painting, or sculpture be considered. Accordingly, the characteristic manufactured articles are those of an artistic nature, as glass work, lace, earthenware, statuary, wood carving, coral carving, and straw plaiting. In what other country have we found that the artistic taste of the people greatly affects their manufactures?



FIG. 209.

The leaning tower of Pisa, which has become tilted because of settling on one side.

Principal Cities. — Estimate the average width of the Italian peninsula. Since it possesses many excellent harbors, we may expect to find numerous large cities along the coast, as in Great Britain.



FIG. 210.

Gate of the Appian Way — one of the ruins of Ancient Rome.

it is situated presents one of the most magnificent sights in the world. On the northwest is the city itself, — about the size of Boston, — rising upon an amphitheatre of hills; toward the east is Mt. Vesuvius (Fig. 211), with the crests of the Appennines in the distant background; and on the southeast is a steep, rocky coast, behind which are numerous villages partly concealed among groves of orange, lemon, and palm trees.

This is one of the most fertile sections of Italy, — thanks to the ashes that have been thrown out of Vesuvius, — and the agricultural population is one of the densest in Europe. The harbor, too, is good, so that there is more shipping here than at any other Italian port with the exception of Genoa. But the secret of so large a city in this agricultural region is found

Naples and Vicinity. — The most populous city is NAPLES (Figs. 207 and 208) in the southern part of the peninsula. The semicircular bay on which

partly in the peculiar character of Italians, who feel a dread of isolated homes such as are common throughout the farming districts of the United States. Consequently they crowd into the villages and cities, even though they must travel a long distance to their field of work, or must suffer now and then from extreme want.

Within plain sight of Naples stands Mt. Vesuvius, a cone of lava and ashes nearly a mile in height, from whose crater vol-



FIG. 211.

A view of Vesuvius, with a part of Pompeii in the foreground.

umes of steam constantly pour forth. At the time of Christ the slopes of this mountain were dotted with productive farms, while thriving towns spread over the country at its base. But in the year 79 an appalling eruption took place which completely buried Pompeii, Herculaneum, and many villages beneath showers of ashes and streams of volcanic mud. Since then many eruptions have been recorded, the last violent one occurring in 1872. During the last half-century the buried cities, especially Pompeii, have been unearthed at great labor and cost. By these excavations much has been learned about

the buildings and customs of the people who lived nearly two thousand years ago.

At present, tourists daily ascend to the top of Vesuvius. There they see one of the most awful sights in the world when they cautiously approach to the very edge of the crater—an opening perhaps a fourth of a mile across—and peer down



FIG. 212.

The Sistine Chapel in the Vatican, where the Pope lives.

into the abyss. Reports like the thunderings of cannon come from far below, and lumps of lava as large as a man's head are often hurled upward. Not seldom lava lumps rise above the mouth of the opening and fall here and there outside, making one's visit all the more exciting by the slight danger of being hit.

Ancient and Modern Rome. — By far the most interesting spot in Italy is ROME, the "Eternal City," long the

capital of the ancient world, afterward the capital of the empire of the Popes, and now the capital of Italy.

The site of Rome was well chosen. It lay near the centre of the Mediterranean, and near the centre of the Italian peninsula as well. In that part of Italy the fertile coastal plains are broad and are intersected by the Tiber,

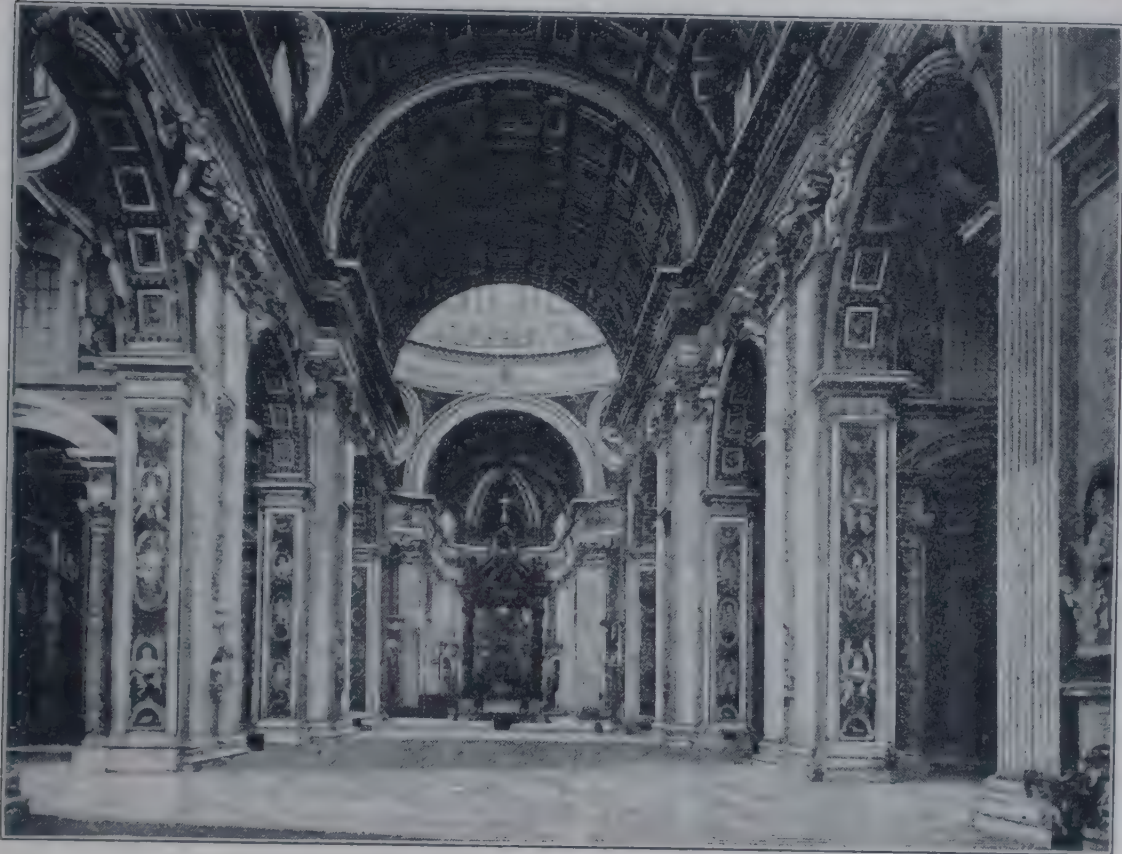


FIG. 213.

Interior of St. Peter's.

the largest river of the country except the Po. In that vicinity, also, the Appennines reach their highest altitude, which insures abundant water supply for the Tiber and for the plains. Moreover, the valley of the Tiber offers one of the most convenient routes across the peninsula. These are some of the advantages that attracted to ancient Rome a population of fully a million, and caused the

surrounding country to be thickly settled and carefully tilled.

Now, however, the city contains less than half as many inhabitants, while the neighboring plains for miles around, though beautiful pasture land, have scarcely a tree or a house upon them. The reason for this strange lack of suburban life is the very prevalent malaria. At present, the country is of use for little else than grazing; and as soon as summer ap-



FIG. 214.

Ruins of the Colosseum at Rome.

proaches even the herdsmen flee with their cattle and sheep to the mountains.

The lower course of the Tiber has gradually become so choked with sediment that it overflows easily; and drainage was so neglected during the Middle Ages, when the petty war lords of the neighborhood were fighting, that vast sums of money would now be needed to free the lands from standing waters. Even the city of Rome is flooded in its lower sections when there is an unusual rise of the Tiber.

But while agriculture and commerce do not flourish near Rome, fine residences, public buildings, art galleries, and notable ruins (Fig. 210) are numerous in the city. The dome of

St. Peter's (Fig. 213) — the largest and most famous church in the world — towers above everything else; and the *Vatican*, where the Pope resides, is the largest palace in Christendom. In the Vatican are some of the finest and most beautiful of paintings (Fig. 212).

The ruins of ancient Rome vie in interest with these products of later Rome, and cover so many acres that the city is almost as much a tomb as a living city. The

most conspicuous relic of the past is the *Colosseum* (Fig. 214), a huge, oval-shaped theatre, open to the sky, with seats for forty or fifty thousand persons. In the days of the Ro-



FIG. 215.

A view of a part of Venice.

man Empire it was used to witness life and death struggles between men, and between men and wild beasts.

The *Forum* is another extensive ruin within the city limits. It was the great public square, on a lowland between some hills; but its monuments, arches, and other ornaments were covered with rubbish during the centuries succeeding the fall of the Empire. The excavation of this famous spot has not yet been completed, whole buildings, as well as smaller objects, having been buried in that locality.

Other Italian Cities. — With the exception of Rome and Naples the large cities of the Italian peninsula are in the northern part. The principal city south of Naples is Palermo, the capital of Sicily, and about the size of Detroit. It is situated in the midst of extensive fruit groves. What fruits would you expect to find there?

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The first large city north of Rome is FLORENCE, on the western base of the Appennines at a junction of roads across the moun-



FIG. 216.

The "Bridge of Sighs" in Venice, across which prisoners were led to hear their sentence before being thrown into a dungeon.

tains. Straw plaiting, mosaic work, and silk manufacturing are important Florentine industries; and the city is famous for its art galleries.

MILAN, the third Italian city in size, owes its importance largely to its location at the crossing of roads running east and west in the Po Valley, and north and south over the Alps. TURIN has flourished

for a similar reason. From very early times these cities have been important trade centres because of their location at the crossing of trade routes in a fertile, densely populated valley. The railways across the Alps (p. 306) have greatly increased their importance.

MILAN possesses a magnificent cathedral built of white marble and adorned with one hundred and twenty-two spires and over four thousand statues. On the wall of an old monastery in Milan is Da Vinci's famous painting, "The Last Supper," photographs of which are often seen in our homes. The city is the centre of the silk trade, and manufactures much cutlery.

GENOA, although separated from the Po Valley by the low Appennines, is the natural port of Milan and Turin. Since it is a port of outlet for so fertile a region, and is now connected with central Europe by railway (p. 305), this city is the most important seaport in Italy.

The principal seaport of the Adriatic is VENICE, one of the most interesting European cities. When hordes of barbarians were invading Italy, some of the residents retreated to a number of small islands in a lagoon, protected from the sea waves by low sand bars. The people developed into a hardy, independent race, largely through contact with the sea. Their very position forced them to become sailors; and the site of their city was favorable for commerce between central Europe and the East. Protected from attack by land, Venice rose in power, and with power came wealth. Many beautiful houses, churches, palaces, and museums are reminders of the ancient splendor; but the city has fallen, like Spain, partly through too much wealth and corruption.

The city is built upon more than a hundred small islands, about two and a half miles from the mainland, with which it is now connected by railway. Naturally, canals take the place of streets. There are one hundred and fifty canals, the main one, or Grand Canal, being flanked on either side by fine residences, whose steps lead down into the water. It is crossed by the noted marble bridge, the Rialto, and has the beautiful church of St. Mark, and the palace of the Doges, near one end. All together

nearly four hundred bridges join the different islands, and there are many narrow footpaths, but since the chief thorough-



FIG. 217.

A gondola in Venice — the ducal palace, or palace of the Doges, is seen on the farther side.

fares are canals, *gondolas* (Fig. 217) take the place of wagons, carriages, and street cars. No doubt thousands of children in that city have never seen a horse.

San Marino and Malta. — *San Marino*, on the opposite side of the peninsula from Florence, although surrounded by lands that belong to the kingdom of Italy, is, like Andorra

(p. 240), a tiny, independent republic. It is the oldest and smallest republic in the world, and owes its independence partly to the fact that the city is on a high hill and, therefore, difficult to capture.

South of Sicily is the tiny island of *Malta* (Fig. 172), which, like Gibraltar, belongs to Great Britain, and is strongly fortified.

REVIEW QUESTIONS. — (1) In what respects is Italy's position favorable? (2) What about the size of the peninsula? (3) Tell about the origin of the people. (4) Tell about the government. (5) What are the principal features of the physiography? (6) What factors equalize the temperature? (7) Tell about the rainfall. (8) What crops are raised? (9) Of what value is irrigation? (10) What con-

ditions especially favor it in the Po Valley? (11) Name the leading agricultural products. (12) What about malaria? (13) What mineral products come from Italy? (14) What other raw products? (15) What is the condition of manufacturing? (16) Write from memory a brief description of Naples and vicinity, including Vesuvius and Pompeii. (17) Give the reasons for the location of Rome. (18) What changes have occurred since the days of the Roman Empire? (19) Tell the principal facts about each of the other cities mentioned: (a) Palermo, (b) Florence, (c) Milan, (d) Turin, (e) Genoa, (f) Venice. (20) What is said about San Marino and Malta?

SUGGESTIONS.—(1) Great Britain has a population of 330 persons to the square mile; Italy has 280. The riches of the former depend largely upon her manufactures; the latter has little manufacturing. What suggestion do you see, therefore, as to the wealth of Italy? (2) Why should Italy have been relatively much more important in former times than now? (3) What colonies has Italy in eastern Africa? Suggest reasons why Italy has so few colonies. (4) What must have been the influence upon Genoa and Venice of the discovery of the ocean route to India? Why? (5) What must have been the influence of the opening of the Suez Canal? Why? (6) Would you expect that Italy would have a large navy? Find out how her navy ranks with those of the other five Great Powers; with that of the United States. (7) Mention advantages and disadvantages of life in Venice. (8) Mention some of the uses of sulphur. (9) What reasons can you give for the peculiar occupations taken up by Italian immigrants to this country? (10) Make a collection of the different famous pictures of the Madonna. (11) Find out about the Catacombs of Rome; the Roads; the Aqueducts. (12) Find out about some of the ancient Romans and Roman customs. (13) Ask some lawyer to tell you what influence Roman law has had upon our own law. (14) Find some facts about Cæsar, Cicero, Dante, and Garibaldi.

XIX. AUSTRIA-HUNGARY

MAP QUESTIONS (Fig. 200, facing p. 301). — (1) Compare Austria-Hungary with Germany in area. (2) Compare the two countries in population. (3) Compare the two in number of large cities. In which, therefore, would you expect to find most development? (4) About what proportion of the boundary is formed by water? (5) What countries border this empire? (6) How does its latitude compare with that of France? Of Italy? (7) What portions are mountainous? (8) What would you say about the variety of climate? (9) What sections do not belong to the Danube basin?

Physiography and Climate. — A large proportion of the boundary line of Austria-Hungary is determined by mountain ranges.



FIG. 218.

A street in a small Alpine village of western Austria.

Point out these ranges. Notice that the Russian boundary extends across an open plain. This plain is Austria's share of Poland, a kingdom which once extended from the Baltic Sea to the Carpathian Mountains. Poland was conquered and divided between Austria, Prussia, and

Russia, Austria receiving the smallest share and Russia the largest.

Austria-Hungary is one of the most mountainous countries in Europe. It includes the eastern half of the Alps (Fig. 218), besides several other ranges. These mountains together form a circle enclosing a broad plain (Fig. 219), through which the Danube River flows. At two points this circle is completely broken: once near Vienna, where the Danube enters the great Hungarian

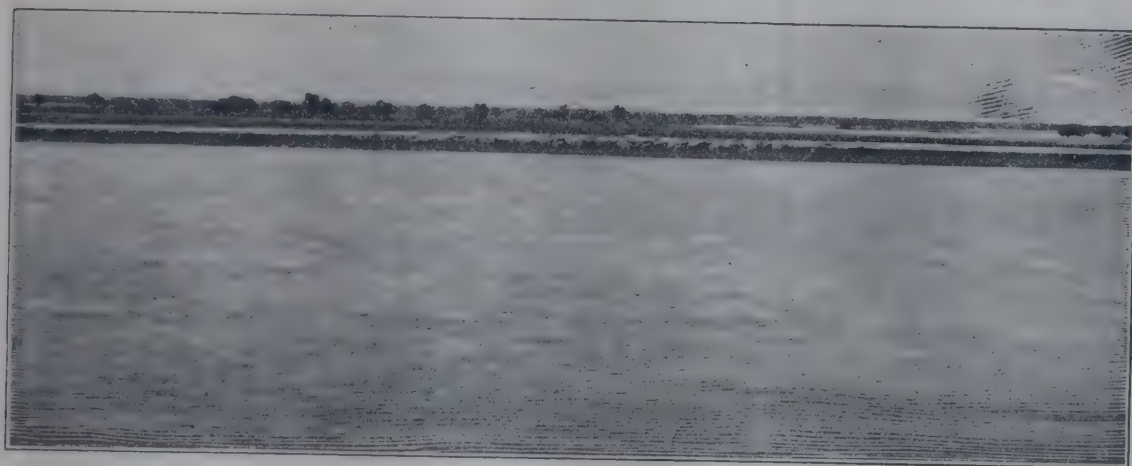


FIG. 219.

The Danube where it flows through the Hungarian plain.

plain (Figs. 200 and 225), and again on the southeastern boundary, where the river leaves the plain.

The Danube Valley is the great trade route of Austria-Hungary, since it offers the best passageway through the mountains. The fact that the river is navigable from Germany to its mouth adds greatly to the value of this route. On the southeastern border, where the river passes through the mountains in a deep gorge (Fig. 220), there is a point, known as the "Iron Gate," where the water flows with rapid current; but a ship canal, cut on one side of the river, now leads around these rapids.

Transportation is all the more confined to the river route because of the peculiar coast line of Austria-Hungary. Although the country is next in size to Russia



FIG. 220.

The gorge where the Danube passes through the mountains in the southeast. Serbia is on the right. The "Iron Gate" is not far distant from this scene.

among European nations, it has only a small amount of coast. Estimate its length. There are numerous harbors, to be sure, but they are difficult of access from the interior, because of the rugged mountains that rise from the very seashore.

At only two points on the Adriatic can good harbors be reached from the Danube lowlands without difficulty. What cities are located at these points?

In so mountainous a country there is naturally much variation both in rainfall and in temperature. Everywhere excepting on the higher mountains, however, the temperature is favorable for the growth of grains and other crops of temperate latitudes. That is, the summers are warm and the winters are cold; but the extremes are much greater than in England. Why? The rainfall of the lowlands, which averages little over twenty inches, is barely sufficient for agriculture, and the plains of Hungary are subject to serious drought in summer.

People and Government. — Such a rugged surface, with many enclosed valleys, separates the people and favors the development of very different customs amongst the inhabitants of different sections. Moreover, the ease of approach from the north and east has led to repeated invasions from these directions. The result has been that the empire of Austria-Hungary is a mixture of many people. Germanic people, who form about a fourth of the entire population, are most numerous in Austria; while the Magyars, a race allied to the Mongolian, form

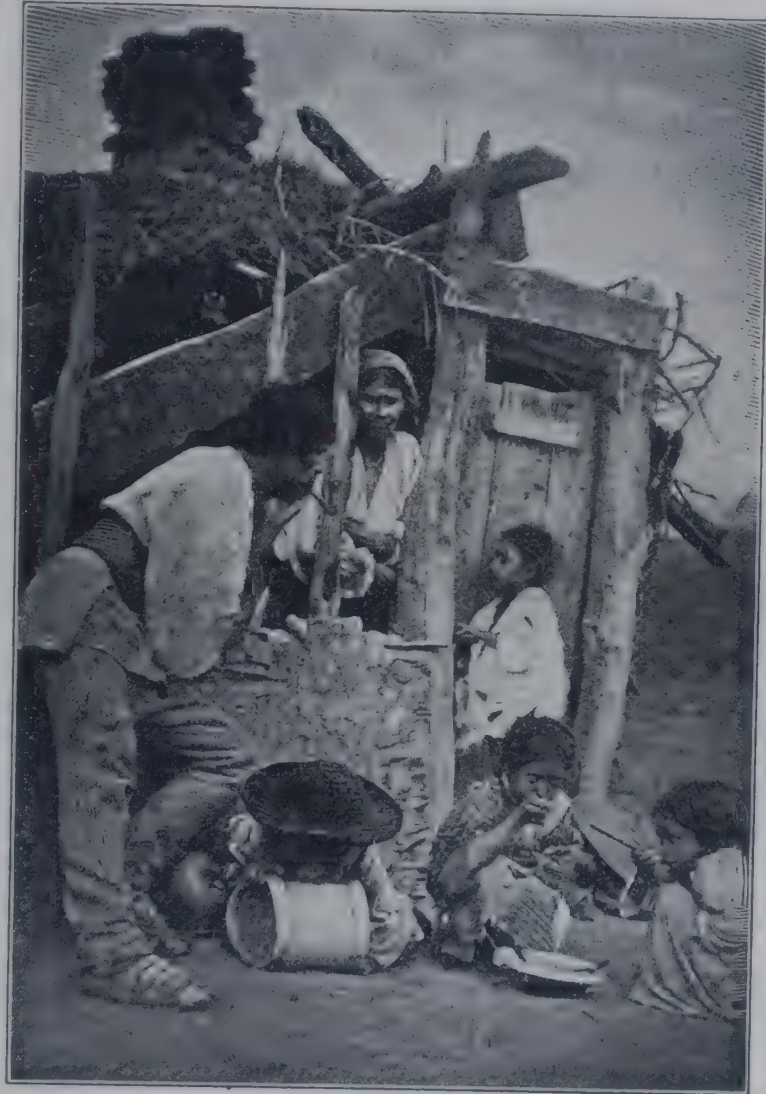


FIG. 221.

A Gypsy family and hut in Austria-Hungary.

nearly half the population of Hungary; but races related to the Slavs of Russia are more numerous than either of the other groups. There are, in addition, large numbers allied to the Italians and other peoples (Fig. 221). German is the official language and is spoken by the educated classes.

There are at least a dozen different languages in the empire, and often two or three are spoken in a single town. To be sure, a statement similar to this might be made in regard to the United States, for we certainly have a great variety of people speaking different languages. But no matter from what part of the earth our citizens have come, they have usually modified their former customs to an astonishing degree, and, in most cases, have become genuine Americans in spirit. The principal exception are the Chinamen, who, instead of



FIG. 222.

The Parliament building at Vienna.

identifying themselves with our ideals and interests, in most cases remain Chinamen as long as they live.

The many distinct peoples of Austria-Hungary resemble the Chinamen in their tendency to remain apart. They are not only dissimilar in religion, ambitions, and customs, but their interests are often conflicting; and they are jealous and suspicious of, and often hostile to, one another.

It has been a difficult matter to bring these people under a common rule. Nevertheless, in 1867, the Austrian Empire and the kingdom of Hungary were united under Emperor

Joseph to form the empire of Austria-Hungary. Each of the countries preserves its own constitution, makes its own laws, and is independent of the other in many respects, as we found to be the case in Norway and Sweden (p. 251). But they work together in matters of common interest, such as the army and navy, foreign affairs, and finance. Much trouble has arisen because of the different ideals and customs of the peoples; and, quite unlike the German Empire, there is danger that the union of Austria-Hungary may not long endure.

Natural Resources. — Many of the mountain slopes are forest-covered, and in the remoter parts wild animals are still found. Since nearly one-third of the empire is wooded, lumber forms one of the important resources of the country.

Where the woods have been cleared away, there are pastures for sheep and goats. Many cattle are also raised, especially on the more fertile lowlands.

Near the Adriatic and in the warmer valleys there are many vineyards; and the mulberry is raised for the silk-worm, as in



FIG. 223.

The wonderfully level Hungarian plain.

Italy (p. 314) and southern France (p. 226). Flax, hemp, corn, sugar beets, and tobacco are other important crops. But the grains, especially wheat, rye, barley, and oats, are the staple agricultural products of both

Austria and Hungary. The broad plains of the Danube (Figs. 219 and 223) form one of the leading wheat-producing regions of Europe. A large amount of this grain is exported, since the people, like the Germans, live much upon rye bread.

There is much mineral wealth in the mountains, including deposits of salt, gold, silver, lead, mercury, and copper. The Hungarian opal is celebrated for its beauty; and the excellent quality of the clays has made possible the manufacture of fine porcelain ware. The mineral quartz supplies the material for the Bohemian glass blowers, who make some of the finest ware in the world. Their glass is beautifully colored by adding small quantities of mineral substances, such as silver, copper, and cobalt, mined in the country.

Both coal and iron are widely distributed (Fig. 113), and Austria-Hungary ranks third among the coal-producing countries of Europe. Some of the best deposits are in the northwest, near PRAGUE, which explains why that city is extensively engaged in iron manufacturing.

Manufacturing and Commerce. — Even at the time of the Romans, Austrian iron ore was smelted by the use of charcoal, and the people have long been extensively engaged in other forms of manufacture. Austria-Hungary does not, however, manufacture nearly as much as Great Britain, Germany, or France. Owing partly to the poor facilities for commerce, and partly to lack of education and common interests among the people, there has been far less development of manufacturing than might be expected from the wonderful resources of the country.

Much of the manufacturing is still done either by hand or by very simple machines. But there has been great progress in recent years, and numerous cotton, woollen,

flour, and paper mills, iron manufactories, and beet-sugar refineries have been set up. There is also silk weaving, for in artistic taste many of the Austrians resemble the French (p. 228). On the whole, the chief manufacturing region is in the northwest, next to Germany, while the principal agricultural section is in the central and eastern parts.



FIG. 224.

Cut showing a castle in Austria, a little village at the base of the hill, and a mill at the left. Notice the thick walls, formerly of use to protect the castle from attack.

There is an extensive internal commerce along the navigable rivers and the railways; but, owing to the limited coast line, ocean commerce is much less developed than in other large European nations. Austria-Hungary has, in fact, a smaller merchant marine than the little country of Greece.

The most natural trade route leads either down the Danube into the Black Sea or else westward into Germany, and thence

down the Rhine Valley. Why in these directions? Less than one-third of the foreign shipping goes by way of Trieste. This means that the greater part of the foreign trade of the empire is carried on through foreign ports. What disadvantages do you see in that fact? Trace the chief routes.

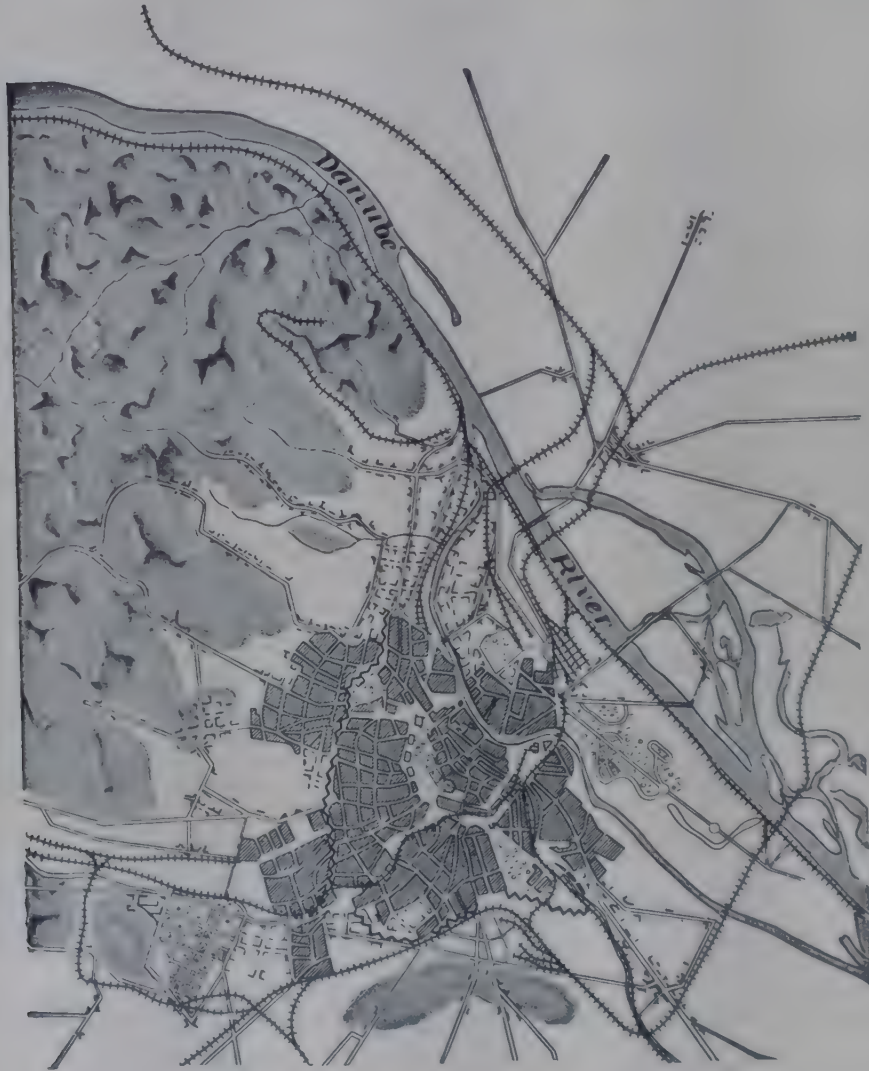


FIG. 225.

To show the location of Vienna at the crossing of railway routes.

Principal Cities.— While there are many small cities in this empire, there are surprisingly few large ones. The two largest, VIENNA, the capital of Austria, and BUDAPEST, the capital of Hungary, are located on the Danube

River and not on the sea-coast. Suggest reasons for this fact.

VIENNA, which is larger than Philadelphia, is the greatest city in Austria-Hungary and the fourth largest in Europe. The reason for its size is found first of all in its location (Fig. 225), on a large river in the central part of Europe. Moreover, it is situated at an opening between



FIG. 226.

A view in Vienna.

mountains, through which, from the earliest times, the best routes have passed from western Europe to Asia, and from northern Europe to the Mediterranean. The railways which lead from St. Petersburg to Rome, and from Berlin and Paris to Constantinople, naturally converge toward this point, making the city a great railway and trade centre. Trace these roads on Figure 119. What countries do they cross?

Vienna is a beautiful city, with many public buildings (Figs. 222 and 226), including the palace of the emperor and some fine museums. The noted University of Vienna is also located here. Naturally there is much manufacturing in and near a city so favorably situated for bringing materials, by rail or river, from all parts of the kingdom.

BUDAPEST (Fig. 227), consisting of two towns (Buda and Pest) on opposite banks of the Danube, is the seat of



FIG. 227.

Looking across the Danube from Pest to Buda.

the Hungarian government and the home of the emperor for a part of each year. These twin cities are located at a point where the Danube is easily bridged; but Budapest has not so fine a location as Vienna and is only about one-third as large. The city is in the midst of the great wheat-raising plains of the Danube, and, like Odessa on the Black Sea, has naturally become extensively engaged in flour manufacture and grain shipment.

PRAGUE, the third city of Austria-Hungary, is situated on the navigable Elbe, which since early times has been an important trade route. Located in the midst of a rich mineral region, it is a noted manufacturing centre, and in population is a little larger than Providence, Rhode Island. TRIESTE, a city about the size of Rochester, New York, is the largest Austrian seaport. Although separated from the main part of the country by mountain ranges, it is connected with the interior by a railway. Even as far back as the time of the Romans, the pass which the railway takes in crossing the mountains was followed as the route of entrance to the Danube Valley. FIUME, southeast of Trieste, has an excellent harbor and is rapidly growing as a port of export for Hungary.

Small Countries. — On the boundary between Austria and Switzerland is *Liechtenstein*, a very small independent country united with Austria-Hungary by a customs treaty. Two other countries, *Bosnia* and *Herzegovina*, formerly parts of Turkey, are now practically a part of Austria-Hungary, and are therefore not marked separately on our maps. They include the mountainous land northwest of Montenegro and Servia.

REVIEW QUESTIONS. — (1) Tell about the physiography of Austria-Hungary. (2) Tell about the climate. (3) What is the condition of the people? (4) What about the government? (5) Name the principal raw products. (6) What is the condition of manufacturing? (7) What about the commerce? (8) Give reasons for the location of Vienna. (9) Tell about the following cities: (a) Budapest, (b) Prague, (c) Trieste, (d) Fiume. (10) What is said about small countries?

SUGGESTIONS. — (1) How must the construction of tunnels through the Alps have affected Austria-Hungary? (2) What would you say as to the relative importance of the Danube and Rhine rivers? (3) Find some Bohemian glass to see how beautiful it is. (4) In an atlas look up Austria-Hungary to find the portions which are called Tyrol, Moravia, Bohemia, and Transylvania. (5) Look up some facts about the history of Poland. (6) Suggest reasons for the absence of Austrian colonies. (7) Find out something about the Triple Alliance. (8) Read about the influence of Emperor Francis Joseph in holding the different parts of the empire together. (9) Find out something about Kossuth.

XX. THE BALKAN PENINSULA

MAP QUESTIONS (Fig. 200, facing p. 301). — (1) What countries border Roumania? (2) Name the countries south of the Danube. (3) What does the map tell you about the surface of each? (4) What may you expect about the variations in climate on this peninsula? Why? About the rainfall? Why? (5) Compare the number of large cities with the number in Germany and Italy. What inferences do you draw concerning the condition of the people? (6) Compare the area of Turkey in Europe with that of your own state.

Physiography and Climate. — This double-pointed peninsula is bounded on one side by the Adriatic and Mediter-



FIG. 228.

A view in Bulgaria, showing its rugged surface.

anean seas, on the other by the Ægean and Black seas. It is unlike other European peninsulas in having a very long land boundary. Trace it. Throughout al-

most its entire extent the surface is mountainous, which offers an explanation of the large number of separate countries on the peninsula. How? Many of the valleys are suitable to agriculture, the most extensive being the plains of the Danube in Roumania and Bulgaria.

The climate varies greatly from mountain to valley and from interior to seashore. Along the southern coast the winters are mild, as elsewhere near the Mediterranean; but in the northeast, near Russia, hot summers are fol-

lowed by cold winters, when icy winds sweep down from the Russian steppes, and the Danube freezes over.

In so mountainous a land there is also much variation in rainfall. On the western slopes, for example near the shores of the Adriatic, there is an abundance of rain; but on the east coast and in the interior valleys, especially in Greece, there is so little rain that agriculture depends



FIG. 229.

A scene just outside Constantinople. These are Asiatic black buffaloes, which are used there as beasts of burden.

upon irrigation. Why is this true of Greece particularly? (p. 161).

People. — The eastern point of the Balkan peninsula comes so close to Asia that it has been called a “bridge” between Europe and Asia. At each of two points, the Dardanelles and the Bosphorus, the continents are separated only by a narrow strait, a barrier so slight that the animals and plants of the country belong to both European and Asiatic species.

This region has also been a bridge for the passage of many peoples. The early inhabitants of the Balkan peninsula belonged to several divisions of the white race.

Among these were the Greeks, who settled along the coast and there developed the Greek civilization. Later the



FIG. 230.

A Roumanian peasant.

region came under the control of the Romans, and at that time Constantinople became renowned for its trade. With the decline of the Roman Empire, Slavs from the Russian plains entered and drove the Greeks back to the coast and a considerable body of the Romans to the mountainous interior. Afterward these Slavs, known as Serbians and Bulgarians, accepted Christianity, adopted civilized ways, and finally became rulers of the peninsula.

Still later came the Moham-
medan Turks, who, crossing from Asia, brought the peninsula under their dominion. Wherever the Turks went they brought ruin ; and for four centuries, while the rest of Europe was advancing, they held this region in subjection and prevented progress. During the nineteenth century, however, many of its people have thrown off the Turkish yoke, so that Turkey in Europe is now less than one-quarter as large as it was a hundred years ago. Nevertheless, the effects of long Turkish misgovernment are clearly seen throughout the entire peninsula.

Aside from Roumania, five nations now occupy the Balkan peninsula : Montenegro, Servia, Bulgaria, the Ottoman Empire or Turkey, and Greece ; and two others, Bosnia and Herzegovina, are under control of Austria-Hungary (p. 337).

Montenegro. — This tiny principality, which is smaller than the state of Connecticut, has maintained its independence largely because of its situation among the mountains. The country is of slight importance; its soil is so poor that there is little agriculture; there is less manufacturing, and not a single railway. The principal occupation is cattle raising.

Servia. — Bordering on southern Hungary, Servia shares some of the advantages of that country, including navigation of the Danube. Since much of its surface is rugged and heavily forested, only a small portion is cultivated. Among the leading products are corn, wheat, and other grains, reminding us of Hungary. There is also much fruit raising, particularly that of grapes and plums, which,

when dried, are sold as raisins and prunes. Many cattle, sheep, and pigs are raised for export, the pigs being allowed to roam in the oak and beech forests. Why there?

The resources of Servia are only partially developed. For example, although coal, iron, lead, silver, and other metals are known to exist, there is very little mining and not much manufacturing. It will require more time to recover from the centuries of Turkish misrule.



FIG. 231.

A Turkish lady, at Constantinople, in street dress.

The capital of the kingdom is **BELGRADE**, a city finely situated upon the Danube.

Roumania and Bulgaria.— These two countries have much in common. Although the Danube separates them for a long distance, they together control its lower course. This is a fact of much importance to Austria-Hungary. Why? Broad plains suited to agriculture border the Danube in both countries, though the plains are far more extensive in Roumania than in Bulgaria. Naturally, therefore, there is much farming. While each of these king-



FIG. 232.

An oil field in Roumania. Each of the derricks in this valley is over an oil well.

doms has been freed from Turkish rule, Bulgaria is still tributary to that country; that is, although in most respects independent and self-governing, it is obliged to pay an annual tribute in money to Turkey.

In both countries wheat and other grains are among the chief crops. But the warmer climate of Bulgaria, south of the Balkan Mountains, permits the culture of products that cannot be raised extensively in Roumania; for example, the mulberry for silk, and roses for the valuable perfume, attar of roses. Many sheep as well as other live stock are raised in each country; in fact, herding is

almost the sole industry on the barren steppes of eastern Roumania. There are large tracts of forest in each, but there is more in Bulgaria, owing to its rugged surface, than in Roumania. Each country has valuable mineral deposits; but, as in Servia, there is little mining. Why? Nor is there much manufacturing, excepting such hand work as the manufacture of Turkish rugs.

With so slight development of the resources, there are few large cities. By far the largest is BUCHAREST, the capital of Roumania. Find the capital of Bulgaria.

Turkey in Europe. — The Turks, who are Moham-medans, are controlled by ideas very unlike those of other Europeans.

They are unprogressive, and inclined to grant no rights to Christians, many of whom still live in Turkey. Their ruler or *Sultan* has absolute power, which he exercises with little conscience, and the government is the worst in Europe.



FIG. 233.

Map showing the location of Constantinople.

Since these people entered Europe from Asia and seized countries belonging to Christians, it would seem that the Great Powers of Europe might unite to drive them back. That they

fail to do this is not because Turkey is considered a desirable neighbor, but rather because of jealousies among the Powers. The fact that the Turks control the narrow strait leading from the Black Sea gives them a strong position. Russia would, beyond question, like to obtain control of the strait, but other



FIG. 234.

St. Sophia, a beautiful church in Constantinople now used as a Mohammedan mosque. This illustrates the Byzantine style of architecture — Byzantium having been the early name of Constantinople.

nations object. Why? Thus Turkey in Europe is permitted to continue its existence. We have already seen, however, that she has lost much of her territory during the nineteenth century (p. 340).

Not only are the mass of Turks in ignorance and pov-

erty, but they are not encouraged to develop the resources of their land. There are valuable mineral deposits, practically unworked ; the great forest tracts have been nearly destroyed ; and broad areas of farm land are cultivated by the use of oxen and tame buffaloes, and by the crude methods of early centuries. Among the principal crops are wheat, corn, flax, hemp, and tobacco. Figs, and grapes for raisins, are also raised. Cattle and sheep are numerous.

As in other slightly developed states, there is little production beyond raw materials ; and while other nations in Europe have rapidly developed in manufacturing, Turkey produces chiefly hand-made goods. Among the latter are the famous

Turkish rugs, and some very beautiful articles in leather and metal, showing that the Turks have much artistic skill. With so little industry there is naturally almost no means of transportation; in fact, the roads are everywhere bad, and railways are almost lacking (Fig. 119).

CONSTANTINOPLE, the capital of the Ottoman Empire, has been famous for many centuries. Being situated on the Bosphorus, where the beautiful, river-like outlet of the Black Sea passes through a valley in the low plateau, it commands the channel through which the commerce of the Black Sea must pass. This is a natural site for a city; for in addition to its location on this water route, it is the point where the crossing can best be made from Europe to Asia. The presence of a harbor on the European side



FIG. 235.

A street view in Constantinople.

-- a small bay at the river mouth called the "Golden Horn" -- and the fact that the founders were Europeans trading in Asia, rather than Asiatics trading in Europe, are reasons why a large city has grown up on the European and not on the Asiatic side.

The site of Constantinople is so advantageous that it was the seat of a Greek colony centuries before the time of Christ.

Later the Roman Emperor Constantine named the city after himself (*Constantine* and *polis*, meaning city) and made it the capital of the Roman Empire. For centuries it was noted as one of the richest and most prosperous cities of Europe. It is still a great centre, and ranks seventh in size among European cities. It is even larger than our American city St. Louis.

After being captured by the Turks, Constantinople lost much of its beauty; but some of its ancient splendor still remains (Fig. 234). There are palaces, mosques, and other interesting and costly buildings; but almost side by side with them are the dwellings of the common people, who live in the most squalid poverty. The houses, street scenes, people, and customs remind one of Asia rather than of Europe.



FIG. 236.

A Greek peasant costume.

Greece. — The southern end of the Balkan peninsula is occupied by Greece. Owing to the many short mountain ranges extending in different directions, the coast line is irregular, with numerous peninsulas, islands, deep bays, and fine harbors, formed by the sinking of the irregular land. The influence of the Mediterranean causes a warm, pleasant climate, as in southern Italy; and the rainfall, which is moderate in winter, is so light in summer that irrigation is necessary for agriculture. The surface

is so rough and rocky that large sections are unfit for farming.

It was in this small peninsula, under what to our eyes appear to be very unfavorable conditions, that the marvellous civilization of ancient *Hellas*, or Greece, was developed. But these conditions really had the tendency to develop strong intellectual powers and brave men. The sea and mountains protected the races from invasion, and the many fine harbors and inlets permitted constant intercourse by water. By the commerce which thus arose the

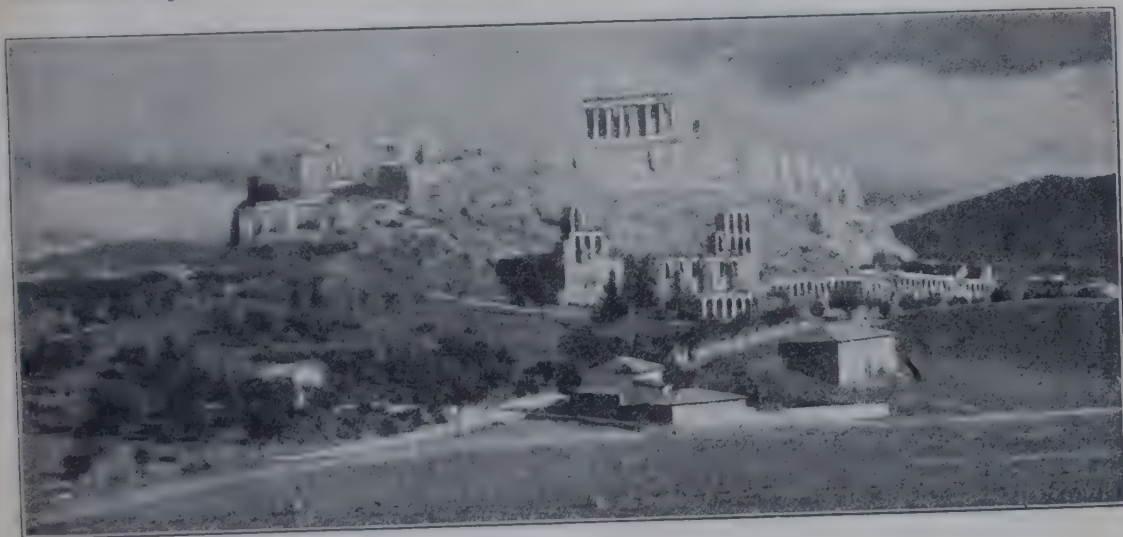


FIG. 237.

A view of the Acropolis at Athens.

Greeks became so acquainted with the sea that they were almost as much at home upon it as upon the land.

In all parts of the world it has been under such general conditions as these that strong races have been evolved. It was true in Scandinavia, in the British Isles, and in the Spanish and Italian peninsulas. It is also true in the Japanese Islands, the home of the most highly developed Asiatics.

Because of their ability to navigate the inland seas, the European Greeks, in very early times, carried on constant communication with the people from whom they had separated, and who still dwelt opposite them, on the coast of

Asia. The arts and customs of their mother country they improved upon, and in time became the greatest power in the then known world. They developed an art and a civilization which, with all our advancement, we have not been able to excel. They also became explorers, and cruised about the entire shores of the Mediterranean at a



FIG. 238.

A shepherd and sheep in Greece.

time when most of Europe was occupied by savages or barbarians. They entered into trade relations with their neighbors, taught them Greek arts, and established

many colonies. Greek arts and literature, we should note, decayed with the loss of freedom in the Greek cities which were conquered by barbarians from the north.

Through colonies in the Italian peninsula, and also through the immigration of individual Greeks, this people exerted a strong influence upon the Romans. Rome finally conquered Greece, although much of Roman civilization, and therefore the civilization of Europe, was due to Greek thought. After the decline of the Roman Empire other northern peoples devastated Greece, and finally the Turks entered and carried ruin to this as to other parts of the Balkan peninsula. Greece is now independent and governed as a limited monarchy.

In this little country there are few natural resources. There is no coal, and therefore little manufacturing

There is some mining, as of lead and zinc ; but the principal occupations are herding and agriculture. Large numbers of sheep and goats are raised ; and the chief farm products are grain, tobacco, olives, and fruits. Among the latter is the small variety of grape, known as the currant. These, together with raisin grapes, are cultivated in large quantities on the steep hillsides and, after being gathered, are dried in the warm, dry summer air.



FIG. 239.

A general view of Athens.

The neighborhood of the sea has led the Greeks to continue their seafaring life, and they still carry on an extensive foreign trade. Many are also engaged in fisheries, and in securing bath sponges from the shallow sea bottom among the Greek islands.

ATHENS, the capital and most important city, with about one hundred thousand inhabitants, is situated inland six miles from its port, PIRÆUS. The principal streets of the present city are quite modern, but ruins of the ancient Athens are still numerous. The most noted buildings, and some of the finest temples of ancient Greece, stood upon the Acropolis (Fig. 237), a level-topped rocky

hill with precipitous sides. This remarkable stronghold was the natural centre for settlements in the surrounding plain.

Islands near Greece. — The many islands in the neighborhood of Greece are either mountain crests or else volcanic cones.



FIG. 240.

View of an olive grove on the island of Corfu, a Greek island off the coast west of Turkey (Fig. 200).

Occasionally we hear of an earthquake shock in this island region or *archipelago*, showing that the mountains are still growing. The largest island near Greece, and the last to be separated from Turkey (1898), is *Crete* (Fig. 172), which, like the smaller islands, is

under the control of the Grecian government and inhabited mainly by Greeks. The inhabitants are engaged in industries that are the same as in Greece itself.

REVIEW QUESTIONS. — (1) Describe the physiography of the Balkan peninsula. (2) Tell about the climate. (3) State some of the main facts in its history. (4) Why were there so many invasions? (5) Name the countries of the peninsula. (6) What can you say about Montenegro? (7) Tell about Servia. (8) In what respects do Bulgaria and Roumania resemble each other? (9) Mention some differences. (10) Locate the capitals. (11) Tell about Turkey in Europe: character of the people; government; resources; manufacturing. (12) What special reasons are there for a large city at Constantinople? (13) Give other facts about the city. (14) Describe Greece: its physiography; climate; reasons for former importance; influence; reasons for decline; present condition; resources. (15) Tell about Athens. (16) What can you tell about the islands near Greece?

SUGGESTIONS. — (1) On Figure 119 note the number of railways in this part of Europe. Why are there so few? (2) What reasons can you suggest for the fact that these eastern countries are in a constant state of unrest? (3) Turkey is occasionally referred to as the "sick man of Europe." Why? (4) How was Greece finely situated for the trade of the ancient world? (5) Learn some facts about Homer, Plato, Aristotle, and other noted Greeks. (6) Read some of the ancient Greek myths. (7) Read about the defence of the Pass of Thermopylæ. (8) What reasons can you suggest for the fact that ancient Greece was divided into several independent states, not unlike our own, but lacking a federal union?

REVIEW OF EUROPE AND COMPARISON WITH NORTH AMERICA

For area, population, etc., see Appendix II.

(1) Compare the climate of western Europe with that of the west coast of North America (p. 160). (2) Make the same comparison for the east coast of North America (p. 162). (3) Explain the resemblances and differences (pp. 160-163). (4) What European countries were covered either wholly or partly by an ice sheet in the Glacial Period? (Fig. 114). (5) Is the coast line of Europe more or less irregular than that of North America? Which continent has the advantage in this respect? How is it an advantage? (6) Name and locate the principal mountain ranges in each continent. Which continent has the advantage as to the direction of the ranges? Why? (p. 162). (7) Name and locate the principal rivers in each continent. Which are the largest? (8) Draw an outline map of Europe inserting the boundaries and names of the countries. (9) How do our larger Western states compare in area with France and Germany? In population? (10) Name the six Great Powers. (11) Which are the two or three most progressive countries? Give some reasons. (12) What is the prevailing kind of government in Europe? In North America? How do you account for the difference? (13) Which European country has, perhaps, the best location for world commerce? Why? (14) Which is best situated for continental commerce? Why? (p. 277). (15) Which country of North America has the most favorable position for trade? How? (16) Compare the five largest European cities with the five largest in North America as to population. (17) State the main advantages of the position of each. (18) Name and locate the five largest seaports of Europe (Fig. 172). (19) How do they compare in population with New York, Philadelphia, Boston, Baltimore, and San

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Francisco? (20) Name and locate the five largest interior cities and compare their population with that of Chicago, St. Louis, Cleveland, Buffalo, and Cincinnati. (21) What cities of Europe and North America are near the 46th parallel of latitude? The 50th? The 60th? (22) Name some agricultural products common to both Europe and the United States. (23) Name others that are found in the United States but not in Europe. Why this difference? (24) In what countries of Europe is silk produced? Why do we not raise silk-worms? (p. 230). (25) Where are grapes raised extensively? Why not in Great Britain? (p. 181). (26) Why is there so little agriculture in Scandinavia? What are the leading industries there? (27) In what countries are sugar beets produced extensively? (28) In what countries is most lumber obtained? (29) Make a list of the European countries which have extensive coal deposits. (30) Which countries have little or none? What is the effect on the industries in each case? (31) Which countries have little or no mining? (32) Which countries have important manufacturing industries? Which have very little? Give the reasons for this difference. (33) With which group would the United States be classed with regard to mining and manufacturing? (34) Which of the European nationalities have you seen on our streets? (35) Where were the beginnings of civilization in Europe? Why there? (36) How do you account for the fact that Europeans pay more attention to fine art than Americans do?

SUGGESTIONS. — (1) Find, in the Statesman's Yearbook or elsewhere, the number of men necessary for the standing armies of each of the six Great Powers. How do these armies compare in size with the standing army of the United States? (2) What illustrations can you give of the fact that nations, like individuals, often flourish for a time and then decline? (3) In the case of nations, what are some of the causes of such changes? (4) Is the United States a young or an old nation? (5) Write a paper stating some of the advantages that we enjoy over European countries. (6) State some of the advantages that they enjoy over us. (7) Which one of the European countries would you prefer to visit? Why? (8) How does the prospect for the future growth of the United States compare with that of the European countries? Why?

APPENDIX I

REFERENCES TO BOOKS, ARTICLES, ETC.

PUBLISHING HOUSES. American Book Co., New York (A. B. C.); D. Appleton & Co., New York (App.); The Century Co., New York (Cent.); Educational Publishing Co., Boston (E. P. C.); Harper & Bros., New York (H. B.); Houghton, Mifflin & Co., Boston (H. M. C.); The Macmillan Co., New York (McM.); G. P. Putnam's Sons, New York (Put.); Charles Scribner's Sons, New York (Scrib.); Silver, Burdett & Co., Boston (S. B. C.).

MAGAZINES. *Century Magazine* (\$0.35 each number), New York (*Cent. Mag.*); *Cosmopolitan* (\$0.10 each), Irvington, N.Y. (*Cos.*); *Chautauquan* (\$0.25 each), Meadville, Pa. (*Chaut.*); *Harper's Magazine* (\$0.35 each), New York (*H. M.*); *Journal of School Geography* (\$0.15 a number, \$1.00 a year), Lancaster, Pa. (*J. S. G.*); *National Geographic Magazine* (\$0.25 a number, \$2.00 a year. Includes membership to Society), Washington, D.C. (*N. G. M.*); *Scribner's Magazine* (\$0.25 each), New York (*S. M.*).

In referring to magazines, the volume is given first, the page last; thus, May, 1891, Volume 6, page 75 = May, '91, 6: 75.

General. Many of the references in the First Book and some of those in the Second Book — for example, references to books on Physiography and the Philippines — would serve for this volume also. It is not, of course, expected that schools will find it possible to obtain all or even a large proportion of those mentioned. These lists, which could easily be multiplied to many times their present size, are offered merely as suggestions to aid those teachers who wish to have a good working library. Many good books are omitted from them, either because of their cost or for other reasons. At the end of each section of Mill's "International Geography" are references to good standard books. See also Mill, "Hints to Teachers, etc., on the Choice of Geographical Books" (Longmans, Green & Co., New York, \$1.25).

Among the many valuable but expensive books of reference mention may be made of Réclus' "The Earth and its Inhabitants" (App., 19 vols., \$5.00 each); Stanford's "Compendiums of Geography" (Scrib., 8 vols. at \$4.50 and 2 vols. at \$8.40); and Baedeker's Guide Books (Scrib.), price variable. The latter may be found in the libraries of friends who have travelled abroad.

There are a number of series for young people which contain good material: For example, Butterworth, "Zigzag Journey Series" (Dana Estes & Co., Boston, 18 vols., \$1.50 each); Hale, "Family Flight Series" (Lothrop Publishing Co., Boston, 5 vols., \$1.50 each); Champney, "Three Vassar Girls" series (Dana Estes & Co., Boston, 11 vols., \$0.75 each).

Every teacher of geography would find Mill's "International Geography," (App., \$3.50) and "The Statesman's Year Book" (McM., \$3.00) of inestimable value. For physiography and climate some help may be gained from Tarr, "First Book of Physical Geography" (McM., \$1.10). For reference to magazines, see First Book of this series, pp. 256 and 257. Every teacher ought to have access to at least one of these magazines, and the subscription price is so low that they are accessible to all. Notice how frequently the *National Geographic Magazine* and the *Journal of School Geography* are referred to in the following lists; yet only a very few have been selected from the great number of really valuable articles. The *Bulletin, American Bureau of Geography*, also contains many valuable articles in each issue.

South America. There is a *Handbook* for each of the republics, issued by the Bureau of American Republics, Washington, D.C., price from \$0.30 to \$0.50 each. Ballou, "Equatorial America" (H. M. C., \$1.50); Carpenter, Geographical Reader, "South America" (A. B. C., \$0.60); Childs, "South American Republics" (H. B., \$3.50); Curtis, "Capitals of Spanish America" (H. B., \$3.50); Coe, "Our American Neighbors" (S. B. C., \$0.60); President Hubbard's Annual Address, "South America" (*N. G. M.*, March, '91, 3:1); "Climatic Notes made during a Voyage around South America" (*J. S. G.*, Sept. and Oct., '98, 2:241 and 297); "A Winter Voyage through the Straits of Magellan" (*N. G. M.*, May, '97, 8:129); "The First Landing on the Antarctic Continent" (*Cent. Mag.*, Jan., '96, 51:432); "Magellan and the Pacific" (*H. M.*, Aug., '90, 81:357); Bates, "A Naturalist on the River Amazon" (Humboldt Library, New York, \$1.00); Andrews, "Brazil. Its Conditions and Prospects" (App., \$1.50); Ford, "Tropical America" (Scrib., \$2.00); "The Valley of the Amazon and its Development" (*J. S. G.*, Sept., '97, 1:193); "The Argentine Capital" (*H. M.*,

March, '91, 82:491); "Argentine Provincial Sketches" (*H. M.*, Apr., '91, 82:781); "The Argentine People," etc. (*H. M.*, May, '91, 82:863); "Patagonia" (*N. G. M.*, Nov., '97, 8:305); "The Republic of Uruguay" (*H. M.*, May, '91, 82:906); "The Republic of Paraguay" (*H. M.*, July, '91, 83:222); Rodway, "In the Guiana Wilds" (*L. C. Page & Co.*, Boston, \$1.25); Curtis, "Venezuela" (*H. B.*, \$1.25); "Venezuela: her government," etc. (*N. G. M.*, Feb., '96, 7:49); "Glimpses of Venezuela and Guiana" (*Cent. Mag.*, July '96, 52:358); Whympers, "Travels amongst the Great Andes of the Equator" (*Scrib.*, \$2.50); "Across the Andes" (*H. M.*, Sept., '90, 81:489); "The Ascent of Illimani" and "Climbing Mount Sorata" (*H. M.*, Oct. and Nov., '99, 99:657 and 863); "The Road to Bolivia" (*N. G. M.*, June and July, 1900, 11:209 and 264); "A Journey in Ecuador" (*N. G. M.*, July, '96, 7:238); Pratt, "Pizarro: Conquest of Peru" (*E. P. C.*, \$0.30); "Impressions of Peru" (*H. M.*, Jan., '91, 82:253); Smith, "Temperate Chile" (*McM.*, \$3.50); "The Climatic Control of Occupation in Chile" (*J. S. G.*, Dec., '97, 1:289); Articles on Chile (*H. M.*, Oct. and Nov., '90, 81:764 and 901); "A Day in the Falkland Islands" (*J. S. G.*, Feb., '98, 2:49).

Europe. Lyde, "A Geography of Europe" (*McM.*, \$0.50); Coe, "Modern Europe" (*S. B. C.*, \$0.60); Emerson, "European Glimpses and Glances" (*Cassell & Co.*, New York, \$1.00); King, "Northern Europe" (*Lee & Shepard*, Boston, \$0.60); Davis, "The Rulers of the Mediterranean" (*H. B.*, \$1.25); "From the Black Forest to the Black Sea" (*H. M.*, Feb. to Aug., '92, Vols. 84 and 85); Lyde, "A Geography of the British Isles" (*McM.*, \$0.60); Green, "A Short Geography of the British Islands" (*McM.*, \$0.90); Davis, "Our English Cousins" (*H. B.*, \$1.25); Pratt, "Stories of England" (*E. P. C.*, \$0.40); Geikie, "The Scenery in Scotland" (*McM.*, \$3.50); Corbin, "Schoolboy Life in England" (*H. B.*, \$1.25); "The Temperature of the British Isles" (*J. S. G.*, Dec., '98, 2:361); "The House of Commons," etc. (*H. M.*, Dec., '93, 88:34); "A General Election in England" (*H. M.*, Sept., '93, 87:489); "London as seen by C. D. Gibson" (*S. M.*, Feb.-June, '97, Vol. 21); "The Geography of Greater London" (*J. S. G.*, Feb., '01, 5:41); "The Best-governed City in the World" (*H. M.*, June, '90, 81:99); "Notes on the Geography of Scotland" (*J. S. G.*, May, '98, 2:161); "From Home to Throne in Belgium" (*H. M.*, Apr., '97, 94:722); "Principal Cities of Holland" (*Chaut.*, June, '98, 27:227); "Land

Wrested from the Sea" (*Chaut.*, Aug. '95, 21:597); "The Picturesque Quality of Holland" (*S. M.*, 2:160; 5:162; 10:621); Macdonald, "Paris of the Parisians" (Lippincott, Philadelphia, \$1.50); Davis, "About Paris" (*H. B.*, \$1.25); "Present Condition of France" (*Chaut.*, Dec., '98, 28:280); "Commerce and Manufactures of France" (*Chaut.*, Aug., '97, 25:480); "The French Army" (*H. M.*, Apr., '91, 82:653); Finck, "Spain and Morocco" (Scrib., \$1.25); Stoddard, "Spanish Cities" (Scrib., \$1.50); Stephens, "Portugal" (Put., \$1.50); Loring, "A Year in Portugal" (Put., \$1.50); "Up Gibraltar; to Tangier; into Spain" (*Chaut.*, Aug., '93, 17:515); Articles on Spanish Cities (*Cos.*, May-Sept., '96, Vol. 21); Thomas, "Sweden and the Swedes" (Rand, McNally & Co., Chicago, \$3.75); Pratt, "Legends of Norseland" (*E. P. C.*, \$0.40); "A Glacier Excursion in Norway" (*Cos.*, Oct., '97, 23:625); Stepniak, "The Russian Peasantry" (*H. B.*, \$1.25); Stepniak, "Russia under the Tzars" (Scrib., \$1.50); Greene, "Army Life in Russia" (Scrib., \$1.25); "Baltic Russia" (*H. M.*, July, '90, 81:295); "The Czar's People" (*H. M.*, June, '98, 97:3); "Awakened Russia" (*H. M.*, May, '98, 96:817); "Finland" etc. (*H. M.*, Feb., '91, 82:330); "The People of the Reindeer" (Laplanders) (*Cent. Mag.*, Aug., '99, 58:582); Pratt, "Stories from Old Germany" (*E. P. C.*, \$0.40); "The Government of German Cities" (*Cent. Mag.*, June, '94, 48:296); "Some Impressions of Berlin" (*Cos.*, Jan., 1900, 28:315); "Impressions of Berlin" (*H. M.*, Aug., '90, 81:340); "Stuttgart" (*H. M.*, Jan. and Feb., '98, 96:269 and 382); "The German Army of To-day" (*H. M.*, May, '92, 84:869); "German Universities" (*Chaut.*, Aug., '96, 23:560); "The German Royal Family" (*Chaut.*, Sept., '96, 23:668); Articles on Germany (*Chaut.*, Oct., '94-Nov., '95, Vols. 20-22); Lubbock, "The Scenery of Switzerland" (McM., \$1.50); "A Thousand Miles through the Alps" (*S. M.*, June, '96, 20:28); "Venice in Easter" (*H. M.*, Apr., '95, 90:738); "Italian Gardens" (*H. M.*, June and Aug., '93, 87:165 and 393); "The Corso of Rome" (*S. M.*, Oct., '91, 10:399); "St. Peter's" (*Cent. Mag.*, July, '96, 52:323); "The Italian Army" (*H. M.*, Aug., '92, 85:419); Whitman, "Austria" (Put., \$1.50); "Vienna as a Type City" (*J. S. G.*, May, '99, 4:175); "The Tyroleans" (*Cos.*, Sept., '98, 25:487); "The Banderium of Hungary" (*S. M.*, Mar., '97, 21:267); "The Austro-Hungarian Army" (*H. M.*, June, '92, 85:50); "Austria" (*J. S. G.*, Dec., '98, 2:394); "Wheeling in Tyrolean Valleys" (*Cent. Mag.*,

Apr., '97, 53:866); "Constantinople" (*S. M.*, Dec., '93-Jan., '94, Vols. 14 and 15); "A Visit to Athens" (*H. M.*, June, '96, 93:3); "In the Wake of a War" (Greece) (*H. M.*, Mar., '98, 96:548).

Asia. Lyde, "A Geography of Asia" (McM., \$0.50); Carpenter, "Asia" (A. B. C., \$0.60); Smith, "Life in Asia" (S. B. C., \$0.60); "Across Asia on a Bicycle" (*Cent. Mag.*, May-Oct., '94, Vol. 48); Series of articles on Southwest Asia and India (*H. M.*, '90, '93-'95, Vols. 81, 87-91); Mathews, "New Testament Times in Palestine" (McM., \$0.75); Douglas, "The Land where Jesus Christ lived" (Thomas Nelson & Sons, New York, \$1.00); Curtis, "Howadji in Syria" (*H. B.*, \$1.50); "The Holy Places of Islam" (*H. M.*, Nov., '92, 85:813); "The Russo-Siberian Plain" (*J. S. G.*, March, '00, 4:81); "A Winter Journey through Siberia" (*Cent. Mag.*, Sept., '91, 42:643); Articles on Siberia (*H. M.*, July and Aug., '98, 97:240 and 327); Lyall, "The Rise of the British Dominion in India" (Scrib., \$1.50); Pratt, "Stories of India" (E. P. C., \$0.40); Kipling, "The Jungle Books" (*Cent.*, \$1.50); Elephant and Tiger Hunting in India (*H. M.*, July and Oct., '92, 85:290 and 706); "An American in Tibet" (*Cent. Mag.*, Nov., '90-March, '91, Vol. 41); "Among the Farthest People" (Tibet) (*Cos.*, Feb., 1900, 28:443); "Life in the Malay Peninsula" (*Cent. Mag.*, Feb., '93, 45:577); Colquhoun, "Overland to China" (*H. B.*, \$3.00); Colquhoun, "China in Transformation" (*H. B.*, \$3.00); "The Crisis in China" (*H. B.*, \$1.00); Little, "Through the Yangtse Gorges" (Scrib., \$2.50); Ralph, "Alone in China" (*H. B.*, \$2.00); Pratt, "Stories of China" (E. P. C., \$0.40); "In the City of Canton" (*Cent. Mag.*, Nov., '94, 49:59); "The Great Wall of China" (*Cent. Mag.*, Jan., '93, 45:327 and 332); Series of Articles on China (*Cent. Mag.*, Aug.-Oct., '99, Vol. 58); also (*H. M.*, June-Aug., '95, Vol. 91); Griffis, "Corea: The Hermit Nation" (Scrib., \$2.50); "Korea and the Koreans" (*N. G. M.*, '90, 2:231); Norman, "The Real Japan" (Scrib., \$1.50); Scidmore, "Jinrikisha Days in Japan" (*H. B.*, \$2.00); Bramhall, "Wee Ones of Japan" (*H. B.*, \$1.00); Series of Articles on Japan (*H. M.*, '94 and '95, Vols. 89 and 90); also (*S. M.*, Apr.-June, '93, Vol. 13); also (*S. M.*, '90 and '91, Vols. 8 and 9); "Japanese Women" (*H. M.*, Dec., '90, 82:119); "An American Artist in Japan" (*Cent. Mag.*, Sept., '89, 38:670).

Africa. Lyde, "A Geography of Africa" (McM., \$0.50); Stanley and others, "Africa: Its Partition and Its Future" (Dodd, Mead &

Co., New York, \$1.25); Badlam, "Views in Africa" (S. B. C., \$0.72); Annual Address of President Hubbard, "Africa, Its Past and Future" (*N. G. M.*, '89, 1: 99); "Africa since 1888" (*N. G. M.*, May, '96, 7: 157); Curtis, "Nile Notes of a Howadji" (H. B., \$1.50); Edwards, "A Thousand Miles up the Nile" (G. Routledge & Sons, New York, \$2.50); Rawlinson, "The Story of Ancient Egypt" (Put., \$1.50); "The Egyptian Sudan and Its History" (*J. S. G.*, Feb. '99, 3: 41); "In Fascinating Cairo" (*Cent. Mag.*, Oct., '99, 58: 811); "Climatic Control in the Desert" (*J. S. G.*, Sept., '99, 4: 255); "A Sahara Caravan" (*S. M.*, March, '93, 13: 315); "Cairo in 1890" (*H. M.*, Oct., Nov., '91, 83: 651 and 828); "Peeps into Barbary" (*H. M.*, Aug., '96, 93: 387); "Tripoli of Barbary" (*S. M.*, Jan., '90, 7: 37); "An Arab Fête in the Desert" (*Cos.*, Apr., '97, 22: 665); Bryce, "Impressions of South Africa" (*Cent.*, \$3.50); Stanley, "Through South Africa" (Scrib., \$1.00); Hillegas, "Oom Paul's People" (App., \$1.50); Bigelow, "White Man's Africa" (H. B., \$2.50); Younghusband, "South Africa of To-day" (McM., \$2.00); "Empire-building in South Africa" (*Cos.*, March, '96, 20: 472); Drummond, "Tropical Africa" (Scrib., \$1.00); Stanley, "My Kalulu" (Scrib., \$1.50); Stanley, "My Dark Companions" (Scrib., \$2.00); "The Pygmies of the Great African Forest" (*S. M.*, Jan., '91, 9: 3); "Abyssinia" (*N. G. M.*, March, '01, 12: 89); "The Gold Coast, Ashanti and Kumassi" (*N. G. M.*, Jan., '97, 8: 1); "Life among the Congo Savages" (*S. M.*, Feb., '90, 7: 135).

Australia, etc. Davitt, "Life and Progress in Australasia" (New Amsterdam Book Co., New York, \$2.50); Pratt, "Stories of Australasia" (E. P. C., \$0.40); Kellogg, "Australia and the Islands of the Sea" (S. B. C., \$0.68); Ballou, "Under the Southern Cross" (H. M. C., \$1.50); "The Australian Horseman" (*H. M.*, July, '99, 99: 257); "Convicts and Bushrangers in Australia" (*Cos.*, May and June, '96, 21: 91 and 173); "New Zealand" (*H. M.*, Aug., '91, 83: 327); Chalmers, "Pioneer Life and Work in New Guinea" (F. H. Revell & Co., New York, \$1.50); Reeves, "Brown Men and Women" (McM., \$3.50); "A Little Journey in Java" (*H. M.*, May, '94, 88: 918); "Down to Java" (*Cent. Mag.*, Aug., '97, 54: 527); "The Climate of the Philippine Islands" (*J. S. G.*, Dec., '99, 3: 361); "The Samoan Islands" (*N. G. M.*, Nov., 1900, 11: 417); "Samoa" (*N. G. M.*, June, 1900, 10: 207).

APPENDIX II

TABLES OF AREA, POPULATION, ETC.

SIZE OF THE EARTH

Length of the Earth's Diameter at the Equator (miles),	7,926	The Earth's Surface (square miles),	196,940,000
Length of Equator (miles),	24,902	Total area of oceans (square miles),	141,486,000

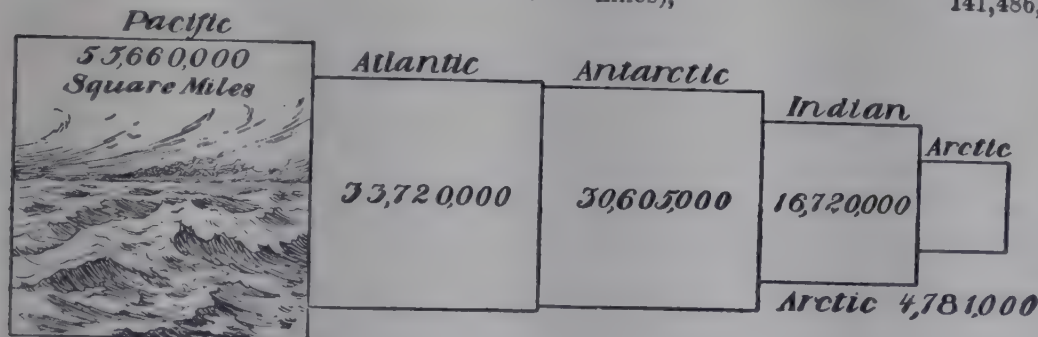


FIG. 436.

Relative areas of oceans. The Antarctic includes the great southern sea surrounding the south pole.

PRINCIPAL COUNTRIES, COLONIES, ETC.

	Area in Square Miles	Popula- tion		Area in Square Miles	Popula- tion
North America, '00.....	8,843,070	103,500,000	Haiti (Island), '97.....	28,250	1,380,000
Alaska, '00.....	590,884	63,592	Honduras, '00.....	46,250	587,500
Bahama Islands, '01.....	5,450	53,735	Jamaica, '98.....	4,200	745,104
Bermuda Islands, '01.....	20	17,535	Mexico, '00.....	767,005	13,545,462
British Honduras, '00.....	7,562	36,993	Newfoundland, '99.....	42,200	210,000
Canada, '01.....	8,653,946	5,369,666	Nicaragua, '00.....	49,200	500,000
Central America, '01.....	181,523	4,015,369	St. Croix, '90.....	84	19,783
Costa Rica, '99.....	22,996	309,683	St. John, '90.....	21	984
Cuba, '99.....	41,655	1,572,797	St. Thomas, '90.....	32	12,019
Greenland, '90.....	500,000	10,516	Salvador, '01.....	7,225	1,006,848
Guatemala, '00.....	48,290	1,574,840	United States. See page after next.		

	Area in Square Miles	Popula- tion		Area in Square Miles	Popula- tion
South America, '00.....	7,681,420	41,200,000	Portugal, '00.....	36,038	5,428,659
Argentina, '00.....	1,113,849	4,794,149	Prussia, '00.....	134,603	34,472,509
Bolivia, '00.....	734,390	1,788,674	Roumania, '99.....	50,720	5,912,520
Brazil, '92.....	3,209,878	18,000,000	Russia, '97.....	2,095,616	106,264,136
Chile, '00.....	279,901	3,128,095	Russian Empire, '97..	8,660,895	129,004,514
Colombia, '81.....	504,733	3,878,600	San Marino, '97.....	23	9,537
Ecuador, '89.....	116,000	1,205,600	Sardinia, '01.....	9,294	789,314
Falkland Isds., '01.....	6,500	2,043	Scotland, '01.....	29,785	4,472,103
Galapagos Isds., '89.....	2,400	400	Servia, '00.....	18,630	2,493,770
Guiana, British, '01....	109,000	288,170	Shetland Isds., '01.....	551	28,185
Guiana, Dutch, '99.....	46,060	67,128	Sicily, '01.....	9,936	3,529,266
Guiana, French, '00....	30,500	80,300	Spain, '97.....	197,670	18,089,500
Juan Fernandez.....	36		Sweden, '00.....	172,876	5,136,441
Paraguay, '99.....	157,000	630,103	Switzerland, '01.....	15,976	3,315,443
Peru, '96.....	695,733	4,609,999	Turkey, '00.....	65,752	6,086,300
South Georgia Isds.....	1,000	uninhabited	Turkish Empire, '00..	1,579,982	40,440,957
Tobago, '01.....	114	18,750	Wales, '01.....	7,446	1,455,881
Trinidad Isd., '01.....	1,754	253,250	Asia, with East Indies, '00, 16,770,951		877,000,000
Uruguay, '00.....	72,210	930,680	Aden, '01.....	80	41,222
Venezuela, '94.....	593,943	2,444,816	Afghanistan, '01.....	215,400	4,000,000
Europe, '00.....	3,855,828	376,400,000	Arabia, '01.....	845,000	6,000,000
Andorra, '97.....	175	6,000	Baluchistan, '01.....	134,000	810,000
Austria, '00.....	115,903	26,150,597	Bhutan, '01.....	16,800	200,000
Austria-Hungary, '00..	264,204	46,810,931	Bokhara, '01.....	92,000	2,500,000
Balearic Isles, '97.....	1,860	306,926	Burma, '01.....	168,550	9,221,161
Belgium, '00.....	11,373	6,693,810	Ceylon, '01.....	25,333	3,576,990
British Empire, '01..	11,137,213	396,105,693	China (proper), '01..	1,353,350	383,000,000
British Isles, '01.....	120,979	41,605,323	Chinese Empire, '01..	4,234,910	399,680,000
Bulgaria, '01.....	37,860	3,733,189	Chinese Turkestan, '01..	431,800	580,000
Corsica, '01.....	3,377	276,829	Cyprus, '01.....	3,584	237,022
Crete, '01.....	3,326	309,253	Formosa, '98.....	18,458	2,640,309
Denmark, '01.....	15,360	2,464,770	French India, '01.....	196	275,100
England, '01.....	50,863	31,070,194	French Indo-China, '01.	256,096	17,999,850
Faroe Isds., '01.....	512	15,230	India, '01.....	1,559,603	294,266,701
France, '01.....	204,092	38,641,333	Japan, '98.....	161,198	46,453,249
German Empire, '00..	208,830	56,367,178	Khiva, '01.....	22,320	800,000
Great Britain, '01.....	88,094	36,998,178	Korea, '01.....	82,000	8-16,000,000
Greece, '96.....	25,014	2,433,806	Manchuria, '01.....	362,310	7,500,000
Hebrides Isds., '97.....	3,000	100,000	Mongolia, '01.....	1,288,000	2,000,000
Hungary, '00.....	125,039	19,092,292	Nepal, '01.....	54,000	2-5,000,000
Iceland, '90.....	39,756	70,927	Oman, '01.....	82,000	1,500,000
Ireland, '01.....	32,583	4,456,546	Palestine, '01.....	10,000	400,000
Italy, '01.....	110,646	32,449,754	Persia, '01.....	628,000	9-9,700,000
Liechtenstein, '91.....	65	9,434	Portuguese Indies, '01..	7,458	300,000
Luxemburg, '00.....	998	236,543	Russia in Asia, '97..	6,564,778	22,697,469
Malta, '00.....	95	183,679	Russian Turkestan, '97.	409,434	4,888,183
Monaco, '90.....	8	13,804	Siam, '01.....	244,000	5,000,000
Montenegro, '01.....	3,680	228,000	Siberia, '97.....	4,838,496	5,727,090
Netherlands, '00.....	12,648	5,179,100	Straits Settlements, '01..	1,472	572,249
Norway, '00.....	124,445	2,239,880	Sungaria, '01.....	147,950	600,000
Orkney Isds., '01.....	876	28,698	Tibet, '01.....	651,500	6,000,000
			Turkey in Asia, '01....	650,394	17,545,300

	Area in Square Miles	Popula- tion		Area in Square Miles	Popula- tion
Africa, '00	11,508,793	170,000,000	Portuguese Guinea, '01...	4,440	820,000
Abyssinia, '01 ..	150,000	3,500,000	Portuguese West Africa, '01	484,800	4,119,000
Algeria (Fr.), '01	184,474	4,774,042	Reunion Island (Fr.), '01...	970	173,200
Ashanti (Br.), '91	15,000	1,473,882	St. Helena (Br.), '01	47	5,195
British Central and South Africa, '00	680,945	3,000,000	Sierra Leone (Br.), '01...	4,000	74,835
British East Africa, '00	1,000,000	6,620,000	Spanish Africa, '97	252,850	130,000
British Somaliland, '91...	68,000	240,000	Togo, '01	33,700	2,500,000
Canary Isds. (Sp.), '97...	2,808	334,521	Transvaal Colony, '98...	119,140	1,094,100
Cape Colony (Br.), '01	276,775	2,350,000	Tripoli (Turk.), '01	398,738	1,300,000
Cape Verde Isds. (Port.)	'00 1,480	147,424	Tunis (Fr.), '01	51,000	1,900,000
Egypt, '97	400,000	9,784,405	Zanzibar (Br.), '01	640	150,000
Egyptian Sudan, '01 ...	950,000	10,000,000	Australia, '01	2,972,573	3,767,443
Eritrea (Italy), '01	88,500	450,000	New South Wales, '01...	310,367	1,352,297
French Sudan, '01	354,000	2,860,000	Northern Territory, '01	—	4,890
French Kongo, '01	496,920	8,950,000	Queensland, '01	668,497	496,596
French Somaliland, '01...	8,640	30,000	South Australia, '01...	903,690	362,604
French Territory, '01...	3,684,144	33,123,880	Tasmania, '01	26,215	172,475
Gambia (Br.), '97	2,700	50,000	Victoria, '01	87,884	1,200,918
German East Afr., '01...	884,180	8,000,000	Western Australia, '01...	975,920	182,553
German Southwest Africa, '01	822,450	202,628	East Indies and Larger Islands of Pacific.		
German Territory, '01...	981,460	14,200,000	Borneo, '91	309,343	2,025,578
Gold Coast (Br.), '01...	40,000	1,473,882	Celebes, '01	71,470	1,997,860
Italian Somaliland, '98...	100,000	400,000	Fiji Islands, '97	8,045	117,870
Kamerun (Ger.), '01...	191,130	3,500,000	Hawaiian Islands, '00	6,449	154,001
Kongo State, '01	900,000	30,000,000	Java, '01	50,554	26,125,053
Liberia, '01	14,360	1,068,000	Molucca Islands, '01...	43,864	399,208
Madagascar (Fr.), '00.	227,750	2,244,872	New Caledonia, '01	7,700	53,000
Madeira Islands, '00	505	150,528	New Guinea, '01	275,329	3,050,000
Mauritius (Br.), '01	705	370,407	New Zealand, '01	104,471	772,719
Morocco, '01 ..	219,000	5,000,000	Philippine Islands, '00...	114,356	8,000,000
Natal (Br.), '00	29,200	929,970	Samoa Islands, '01	1,079	36,300
Niger Territories (Br.), '01	4-500,000	25-40,000,000	Solomon Islands, '01...	16,300	175,000
Orange River Col., '90...	48,326	207,508	Sumatra, '01	161,612	3,209,037
Portuguese E. Afr., '01...	301,000	3,120,000			

STATES AND TERRITORIES OF THE UNITED STATES

	Area in Square Miles	Popula- tion, 1900		Area in Square Miles	Popula- tion, 1900
Alabama	52,250	1,828,697	Georgia	59,475	2,216,331
Alaska	590,884	63,592	Guam, '97	180	8,561
Arizona	113,020	122,931	Hawaiian Islands	6,449	154,001
Arkansas	53,850	1,311,564	Idaho	84,800	161,772
California	158,360	1,485,053	Illinois	56,650	4,821,550
Colorado	103,925	539,700	Indiana	36,350	2,516,462
Connecticut,	4,990	908,355	Indian Territory	31,400	391,960
Delaware	2,050	184,735	Iowa	56,025	2,231,853
District of Columbia	70	278,718	Kansas	82,080	1,470,495
Florida	53,680	528,542	Kentucky	40,400	2,147,174

	Area in Square Miles	Popula- tion, 1900		Area in Square Miles	Popula- tion, 1900
Louisiana	48,720	1,381,625	Pennsylvania	45,215	6,802,115
Maine	33,040	694,466	Philippine Islands, '00 ..	114,356	8,000,000
Maryland	12,210	1,190,050	Porto Rico, '99	3,550	953,243
Massachusetts	8,315	2,805,346	Rhode Island	1,250	428,556
Michigan	58,915	2,420,982	South Carolina	30,570	1,340,316
Minnesota	83,365	1,751,394	South Dakota	77,650	401,570
Mississippi	46,810	1,551,270	Tennessee	42,050	2,020,616
Missouri	69,415	3,106,665	Texas	265,780	3,648,710
Montana	146,080	243,329	Tutuila	55	3,750
Nebraska	77,510	1,063,539	Utah	84,970	276,749
Nevada	110,700	42,335	Vermont	9,565	343,641
New Hampshire	9,305	411,588	Virginia	42,450	1,854,184
New Jersey	7,815	1,883,669	Washington	69,180	518,103
New Mexico	122,580	195,310	West Virginia	24,750	958,800
New York	49,170	7,268,012	Wisconsin	56,040	2,069,042
North Carolina	52,250	1,893,810	Wyoming	97,890	92,531
North Dakota	70,795	319,146	United States, total	3,741,074	85,268,941
Ohio	41,060	4,157,545	United States (without Alaska, Philippine Isds., etc.) ..	3,025,600	76,085,794
Oklahoma	39,030	398,245			
Oregon	96,030	413,536			

TWENTY-FIVE LARGEST CITIES IN THE WORLD

	Population		Population
1. London, England, '01	4,536,063	13. Moscow, Russia, '97	988,614
2. New York, U.S., '00	3,437,202	14. Tienstin, China, '97	950,000
3. Paris, France, '01	2,660,559	15. Peking, China, '98	900,000
4. Canton, China, '97	2,500,000	16. Buenos Aires, Argentina, '00 ..	821,291
5. Berlin, Germany, '00	1,888,326	17. Hankau, China, '97	800,000
6. Chicago, U.S., '00	1,698,575	18. Bombay, India, '01	770,843
7. Vienna, Austria-Hungary, '00 ..	1,674,957	19. Glasgow, Scotland, '01	735,906
8. Tokio, Japan, '98	1,440,121	20. Hamburg, Germany, '00	705,738
9. Philadelphia, U.S., '00	1,293,697	21. Hangchau, China, '97	700,000
10. St. Petersburg, Russia, '97 ..	1,267,023	22. Liverpool, England, '01	684,947
11. Constantinople, Turkey, '01 ..	1,136,000	23. Fuchau, China, '97	650,000
12. Calcutta, India, '01	1,121,664	24. Warsaw, Russia, '97	638,209
		25. St. Louis, U.S., '00	575,238

TWENTY-FIVE LARGEST CITIES IN THE UNITED STATES IN 1900

	Population		Population
1. New York, N.Y.	3,437,202	14. Milwaukee, Wis.	285,315
2. Chicago, Ill.	1,698,575	15. Washington, D.C.	278,718
3. Philadelphia, Pa.	1,293,697		
4. St. Louis, Mo.	575,238	16. Newark, N.J.	246,070
5. Boston, Mass.	560,892	17. Jersey City, N.J.	206,433
6. Baltimore, Md.	508,957	18. Louisville, Ky.	204,731
7. Cleveland, Ohio.	381,768	19. Minneapolis, Minn.	202,718
8. Buffalo, N.Y.	352,387	20. Providence, R.I.	175,597
9. San Francisco, Cal.	342,782		
10. Cincinnati, Ohio	325,902	21. Indianapolis, Ind.	169,164
11. Pittsburg, Pa.	321,616	22. Kansas City, Mo.	163,752
12. New Orleans, La.	287,104	23. St. Paul, Minn.	163,065
13. Detroit, Mich.	285,704	24. Rochester, N.Y.	162,608
		25. Denver, Colo.	133,859

CITIES OF THE UNITED STATES WITH 25,000 OR MORE INHABITANTS
IN 1900; AND A FEW OTHERS, MOSTLY MENTIONED IN THE BOOK

(Cuban cities listed here)

Population	Population
Akron, Ohio.....42,728	Concord, N.H.19,632
Albany, N.Y.94,151	Council Bluffs, Iowa.....25,802
Albuquerque, N.M.6,238	Covington, Ky.42,938
Allegheny, Pa.129,896	Cripple Creek, Colo.10,147
Allentown, Pa.35,416	Dallas, Tex.42,638
Altoona, Pa.38,973	Danville, Va.16,520
Annapolis, Md.8,402	Davenport, Iowa.....35,254
Ashland, Wis.13,074	Dayton, Ohio85,333
Atchison, Kan.15,722	Denver, Colo.133,859
Atlanta Ga.89,872	Des Moines, Iowa.....62,139
Atlantic City, N.J.27,838	Detroit, Mich.285,704
Auburn, N.Y.30,345	Dover, Del.3,329
Augusta, Ga.39,441	Dubuque, Iowa.....36,297
Augusta, Me.11,683	Duluth, Minn.52,969
Austin, Tex.22,258	Durham, N.C.6,679
Baltimore, Md.508,957	Easton, Pa.25,238
Bangor, Me.21,850	East St. Louis, Ill.29,655
Bath, Me.10,477	Elizabeth, N.J.52,130
Baton Rouge, La.11,269	Elmira, N.Y.35,672
Bay City, Mich.27,628	El Paso, Tex.15,906
Bayonne, N.J.32,722	Erie, Pa.52,733
Binghamton, N.Y.39,647	Evansville, Ind.59,007
Birmingham, Ala.38,415	Fall River, Mass.104,863
Bismarck, N.D.3,319	Fitchburg, Mass.31,531
Boise, Idaho.....5,957	Fort Wayne, Ind.45,115
Boston, Mass.560,892	Fort Worth, Tex.26,688
Bridgeport, Conn.70,996	Frankfort, Ky.9,487
Brockton, Mass.40,063	Galveston, Tex.37,789
Buffalo, N.Y.352,387	Gloucester, Mass.26,121
Burlington, Vt.18,640	Grand Rapids, Mich.87,565
Butte, Mont.30,470	Greenville, S.C.11,860
Cambridge, Mass.91,886	Guthrie, Ok.10,006
Camden, N.J.75,935	Harrisburg, Pa.50,167
Canton, Ohio30,667	Hartford, Conn.79,850
Carson City, Nev.2,100	Havana, Cuba, '99.....235,981
Cedar Rapids, Iowa.....25,656	Haverhill, Mass.37,175
Charleston, S.C.55,807	Helena, Mont.10,770
Charleston, W. Va.11,099	Hoboken, N.J.59,364
Charlotte, N.C.18,091	Holyoke, Mass.45,712
Chattanooga, Tenn.32,490	Honolulu, Hawaiian Islands.....39,306
Chelsea, Mass.34,072	Houston, Tex.44,633
Chester, Pa.33,988	Indianapolis, Ind.169,164
Cheyenne, Wyo.14,087	Jackson, Mich.25,180
Chicago, Ill.1,698,575	Jackson, Miss.7,816
Cincinnati, Ohio325,902	Jacksonville, Fla.28,429
Cleveland, Ohio.....381,768	Jefferson City, Mo.9,664
Colorado Springs, Colo.21,085	Jersey City, N.J.206,433
Columbia, S.C.21,108	Johnstown, Pa.35,936
Columbus, Ga.17,614	Joliet, Ill.29,358
Columbus, Ohio125,560	Joplin, Mo.26,028

Population	Population
Juneau, Alaska.....1,864	Pierre, S.D.2,306
Kansas City, Kan.51,418	Pittsburg, Pa.821,616
Kansas City, Mo.163,752	Plymouth, Mass.9,562
Key West, Fla.17,114	Portland, Me.50,145
Knoxville, Tenn.32,637	Portland, Ore.90,426
Lacrosse, Wis.28,895	Ponce, Porto Rico, '99.....27,952
Lancaster, Pa.41,459	Providence, R.I.175,597
Lansing, Mich.16,485	Pueblo, Colo.26,157
Lawrence, Mass.62,559	Quincy, Ill.36,252
Leadville, Colo.12,455	Racine, Wis.29,102
Lewiston, Me.23,761	Raleigh, N.C.13,643
Lexington, Ky.26,369	Reading, Pa.78,961
Lincoln, Neb.40,169	Richmond, Va.85,050
Little Rock, Ark.38,307	Roanoke, Va.21,445
Los Angeles, Cal.102,479	Rochester, N.Y.162,608
Louisville, Ky.204,731	Rockford, Ill.31,051
Lowell, Mass.94,969	Rutland, Vt.11,499
Lynchburg, Va.18,891	Sacramento, Cal.29,282
Lynn, Mass.68,513	Saginaw, Mich.42,345
Madison, Wis.19,164	St. Joseph, Mo.102,979
Malden, Mass.33,664	St. Louis, Mo.575,238
Manchester, N.H.56,987	St. Paul, Minn.163,065
Manila, Philippines, '01.....350,000	Salem, Mass.35,956
Marquette, Mich.10,058	Salem, Ore.4,256
Matanzas, Cuba, '99.....45,282	Salt Lake City, Utah.....53,531
McKeesport, Pa.34,227	San Antonio, Tex.53,321
Memphis, Tenn.102,320	San Francisco, Cal.342,782
Milwaukee, Wis.285,315	San Juan, Porto Rico, '99.....32,048
Minneapolis, Minn.202,718	Santa Fé, N.M.5,603
Mobile, Ala.38,469	Santiago, Cuba, '99.....45,478
Montgomery, Ala.30,346	Savannah, Ga.54,244
Montpelier, Vt.6,266	Schenectady, N.Y.31,682
Nashville, Tenn.80,865	Scranton, Pa.102,026
Newark, N.J.246,070	Seattle, Wash.80,671
New Bedford, Mass.62,442	Sioux City, Iowa.....33,111
New Britain, Conn.25,998	Sioux Falls, S.D.10,266
Newcastle, Pa.28,339	Sitka, Alaska1,396
New Haven, Conn.108,027	Somerville, Mass.61,643
New Orleans, La.287,104	South Bend, Ind.35,999
Newport, Ky.28,301	South Omaha, Neb.26,001
Newton, Mass.33,587	Spokane, Wash.36,848
New York, N.Y.3,487,202	Springfield, Ill.34,159
Norfolk, Va.46,624	Springfield, Mass.62,059
Oakland, Cal.66,960	Springfield, Ohio.....38,253
Ogden, Utah.....16,313	Superior, Wis.31,091
Oklahoma, Ok.10,037	Syracuse, N.Y.108,374
Olympia, Wash.4,082	Tacoma, Wash.37,714
Omaha, Neb.102,555	Tallahassee, Fla.2,981
Oshkosh, Wis.28,284	Taunton, Mass.31,036
Passaic, N.J.27,777	Terre Haute, Ind.36,673
Paterson, N.J.105,171	Toledo, Ohio.....181,822
Pawtucket, R.I.39,231	Topeka, Kan.33,608
Peoria, Ill.56,100	Trenton, N.J.78,807
Philadelphia, Pa.1,293,697	Troy, N.Y.60,651
Phoenix, Ariz.5,544	Tucson, Ariz.7,531

Population	Population
Utica, N. Y.56,888	Williamsport, Pa.28,757
Virginia City, Nev.2,695	Wilmington, Del.76,508
Washington, D. C.278,718	Woonsocket, R. I.28,204
Waterbury, Conn.45,859	Worcester, Mass.118,421
Wheeling, W. Va.38,878	Yonkers, N. Y.47,981
Wichita, Kan.24,671	York, Pa.38,705
Wilkes Barre, Pa.51,721	Youngstown, Ohio.44,885

FOREIGN CITIES MENTIONED IN THE TEXT

Population	Population
Aachen, Germany, '00.735,235	Bordeaux, France, '01.257,471
Abbeokuta, Niger Terr., '97.150,000	Bradford, England, '01.279,809
Aberdeen, Scotland, '01.143,722	Bremen, Germany, '00.163,418
Adelaide, Australia, '01.160,691	Breslau, Germany, '00.422,738
Aden, Aden, '91.41,910	Brindisi, Italy, '97.14,000
Adiz Abeba, Abyssinia, '01.10,000	Brisbane, Australia, '01.119,428
Alexandria, Egypt, '97.319,766	Bristol, England, '01.328,842
Algiers, Algeria, '99.96,784	Brussels, Belgium, '00.561,782
Amsterdam, Netherlands, '00.520,602	Bucharest, Roumania, '00.282,071
Antwerp, Belgium, '00.235,600	Budapest, Austria-Hungary, '00.732,322
Archangel, Russia, '97.17,802	Buenos Aires, Argentina, '00.821,291
Arequipa, Peru, '01.35,000	Cadiz, Spain, '97.70,177
Asuncion, Paraguay, '95.45,000	Cairo, Egypt, '97.570,062
Athens, Greece, '96.111,486	Calcutta, India, '01.1,121,664
Auckland, New Zealand, '01.34,213	Callao, Peru, '01.16,000
Bagdad, Turkey in Asia, '00.145,000	Cambridge, England, '91.36,983
Bahia, Brazil, '90.174,412	Canton, China, '97.2,500,000
Baku, Russia, '97.112,253	Cape Town, Cape Colony, '91.51,251
Ballarat, Australia, '99.46,410	Caracas, Venezuela, '94.72,429
Bangkok, Siam, '96.250,000	Cardiff, Wales, '01.164,420
Barcelona, Spain, '97.509,589	Cartagena, Colombia, '86.20,000
Barmen, Germany, '00.141,947	Cartagena, Spain, '97.86,245
Basel, Switzerland, '01.111,009	Catania, Italy, '01.149,694
Batavia, Java, '97.115,567	Cayenne, French Guiana, '97.12,351
Belfast, Ireland, '01.348,876	Cettinge, Montenegro, '97.2,920
Belgrade, Servia, '00.69,097	Chemnitz, Germany, '00.206,584
Benares, India, '01.203,095	Chengtu, China, '96.250,000
Bendigo, Australia, '97.43,112	Christchurch, New Zealand, '01.17,538
Berbera, Br. Somaliland, '97.30,000	Christiania, Norway, '98.200,000
Bergen, Norway, '01.72,251	Ciudad Bolivar, Venezuela, '91.11,686
Berlin, Germany, '00.1,888,826	Cologne, Germany, '00.372,229
Berne, Switzerland, '01.64,864	Colon, Columbia, '97.3,000
Bethany, Holy Land, '90.1,105	Constantinople, Turkey, '01.1,125,000
Bethlehem, Holy Land, '97.5,000	Copenhagen, Denmark, '01.378,235
Bilbao, Spain, '97.74,093	Cordoba, Argentina, '01.50,000
Birmingham, England, '01.522,182	Cordoba, Spain, '97.57,313
Bloemfontein, South Africa, '90.3,879	Cork, Ireland, '01.99,693
Bogota, Colombia, '86.120,000	Cuzco, Peru, '96.20,000
Bologna, Italy, '01.152,009	Damascus, Turkey in Asia, '00.140,500
Bombay, India, '01.770,843	Danzig, Germany, '00.140,589

Population		Population	
Dawson, Canada, '01	9,142	Kiev, Russia, '97	247,482
Delhi, India, '01	208,385	Kimberley, Cape Colony, '91	28,718
Dover, England, '91	33,418	Kingston, Jamaica, '91	46,542
Dresden, Germany, '00	395,349	Kioto, Japan, '98	353,139
Dublin, Ireland, '01	286,328	Krefeld, Germany, '00	106,928
Dundee, Scotland, '01	160,871	Kumassi, Ashanti, '97	18,000
Dunedin, New Zealand, '01	24,879	La Guaira, Venezuela, '97	8,000
Durban, Natal, '00	43,410	La Paz, Bolivia, '00	57,000
Edinburgh, Scotland, '01	316,479	La Plata, Argentina, '01	61,000
Elberfeld, Germany, '09	156,937	Lassa, Tibet, '97	25,000
Essen, Germany, '00	118,863	Leeds, England, '98	428,953
Fachau, China, '98	400,000	Leghorn, Italy, '00	98,505
Flume, Austria-Hungary, '00	38,955	Leicester, England, '01	211,574
Fez, Morocco, '89	140,000	Leipzig, Germany, '00	455,089
Florence, Italy, '01	204,950	Leith, Scotland, '01	76,667
Frankfort, Germany, '00	288,489	Libreville, French Kongo, '97	3,000
Fredericton, Canada, '01	7,117	Liege, Belgium, '00	173,708
Freetown, Sierra Leone, '91	30,033	Lille, France, '01	215,431
Fuchau, China, '97	650,000	Lima, Peru, '91	103,956
Geneva, Switzerland, '01	105,139	Limoges, France, '01	83,569
Genoa, Italy, '01	234,800	Lisbon, Portugal, '00	357,000
Georgetown, British Guiana, '01	53,176	Liverpool, England, '01	684,947
Ghent, Belgium, '00	160,949	Loanda, Port. W. Africa, '97	14,000
Gibraltar, Spanish Pen., '00	27,460	Lodz, Russia, '97	315,209
Glasgow, Scotland, '01	735,906	London, Canada, '01	37,983
Göteborg, Sweden, '00	130,619	London, England, '01	4,536,063
Grenada, Spain, '97	75,054	London, Greater, '01	6,580,616
Grimsby, England, '01	63,138	Lourenço Marquez, Port. E. Af., '00	6,630
Guatemala, Guatemala, '93	72,102	Lucerne, Switzerland, '01	29,633
Guayaquil, Ecuador, '98	50,000	Lucknow, India, '01	263,951
Hyderabad, India, '01	446,291	Lyon, France, '96	458,145
Hague, The, Netherlands, '00	212,211	Madras, India, '01	509,397
Halifax, Canada, '00	40,787	Madrid, Spain, '97	512,150
Halle, Germany, '00	156,611	Magdeburg, Germany, '00	229,663
Hamburg, Germany, '00	705,738	Malaga, Spain, '97	125,579
Hamilton, Canada, '01	52,550	Manãos, Brazil, '98	20,000
Hammerfest, Norway, '91	2,239	Manchester, England, '97	543,969
Hangchau, China, '97	700,000	Mandalay, Burma, '01	182,498
Hankau, China, '97	800,000	Marseille, France, '01	494,769
Hanover, Germany, '00	235,666	Maskat, Oman, '97	40,000
Havre, France, '01	129,014	Mecca, Turkey, '01	60,000
Hebron, Holy Land, '97	10,000	Melbourne, Australia, '01	493,956
Helsingfors, Russia, '96	77,484	Messina, Italy, '01	149,823
Hobart, Tasmania, '01	24,654	Metz, Germany, '00	58,462
Hongkong, China, '01	297,212	Mexico City, Mexico, '95	344,877
Hue, French Ind. China, '97	30,000	Milan, Italy, '01	491,460
Hull, England, '01	240,618	Mocha, Turkey in Asia, '97	5,000
Iquique, Chile, '00	42,440	Mombasa, Br. E. Africa, '01	27,000
Irkutsk, Siberia, '96	51,434	Monrovia, Liberia, '97	5,000
Jerusalem, Holy Land, '01	42,000	Montevideo, Uruguay, '97	249,251
Johannesburg, Transvaal, '96	102,078	Montreal, Canada, '01	266,826
Joppa, Holy Land, '97	23,000	Morocco, Morocco, '97	50,000
Kabul, Afghanistan, '97	70,000	Moscow, Russia, '97	988,614
Khartum, Egyptian Sudan, '98	25,000	Munich, Germany, '00	499,950
Khelat, Baluchistan, '97	14,000	Nagoya, Japan, '98	244,145

Population	Population
Naples, Italy, '01.....563,731	Seville, Spain, '97.....146,205
Nazareth, Holy Land, '97.....7,500	Sèvres, France, '91.....6,902
Newcastle, England, '01.....214,803	Shanghai, China, '00.....620,000
Nice, France, '01.....125,099	Sheffield, England, '01.....380,717
Nijni Novgorod, Russia, '97.....95,124	Siangtan, China, '98.....1,000,000
Nottingham, England, '99.....239,753	Singanfu, China, '98.....600,000
Nuremberg, Germany, '00.....261,022	Singapore, Straits Settlements, '01...228,555
Odessa, Russia, '97.....405,041	Smyrna, Turkey, '85.....200,000
Oporto, Portugal, '00.....172,421	Sofia, Bulgaria, '00.....67,920
Osaka, Japan, '98.....821,235	Southampton, England, '01.....104,911
Ottawa, Canada, '01.....59,902	Stettin, Germany, '00.....210,680
Oxford, England, '01.....49,413	Stockholm, Sweden, '00.....300,624
Palermo, Italy, '01.....310,352	Strassburg, Germany, '00.....150,268
Panama, Columbia, '86.....30,000	Stuttgart, Germany, '00.....176,318
Para, Brazil, '92.....65,000	Suchau, China, '00.....500,000
Paramaribo, Dutch Guiana, '99.....31,427	Sucre, Bolivia, '00.....20,900
Paris, France, '01.....2,660,559	Suez, Egypt, '82.....10,919
Peking, China, '98.....900,000	Swansea, Wales, '01.....94,514
Pernambuco, Brazil, '90.....111,556	Sydney, Australia, '00.....451,000
Perth, West Australia, '97.....36,199	Tananarivo, Madagascar, '97.....90,000
Pietermaritzburg, Natal, '01.....28,500	Tangier, Morocco, '89.....30,000
Piræus, Greece, '96.....42,169	Tashkend, Russian Turkestan, '97...156,414
Pisa, Italy, '01.....61,279	Teheran, Persia, '97.....210,000
Port Arthur, Russia in Asia.....	Tiberias, Holy Land, '97.....3,000
Port au Prince, Haiti, '97.....60,000	Tientsin, China, '97.....950,000
Port Said, Egypt, '97.....42,095	Tiflis, Russia, '97.....160,645
Portsmouth, England, '01.....189,160	Timbukto, Sudan, '97.....20,000
Posen, Germany, '00.....117,014	Tokio, Japan, '98.....1,440,121
Potsdam, Germany, '00.....59,814	Toronto, Canada, '01.....207,971
Prague, Austria-Hungary, '00.....201,589	Trebizond, Turkey in Asia, '97.....35,000
Pretoria, Transvaal, '96.....10,000	Trieste, Austria-Hungary, '00.....134,148
Pueblo, Mexico, '95.....91,917	Tripoli, Tripoli, '85.....30,000
Quebec, Canada, '01.....68,834	Trondhjem, Norway, '00.....38,180
Queenstown, Ireland, '91.....9,082	Tunis, Tunis, '00.....170,000
Quito, Ecuador, '97.....80,000	Turin, Italy, '01.....335,639
Rangoon, Burma, '01.....232,326	Upervnik, Greenland, '70.....700
Reims, France, '01.....107,773	Valencia, Spain, '97.....204,768
Riga, Russia, '97.....232,943	Valparaiso, Chile, '00.....135,674
Rio de Janeiro, Brazil, '90.....522,651	Vancouver, Canada, '91.....26,196
Rome, Italy, '01.....463,000	Venice, Italy, '01.....151,841
Rosario, Argentina, '01.....112,461	Vera Cruz, Mexico, '95.....88,993
Rotterdam, Netherlands, '01.....332,185	Verseilles, France, '01.....54,081
Roubaix, France, '01.....124,660	Victoria, Canada, '01.....20,821
Rouen, France, '01.....115,914	Vienna, Austria-Hungary, '00.....1,674,957
St. Etienne, France, '01.....146,671	Vladivostok, Siberia, '96.....43,843
St. John, Canada, '01.....40,711	Warsaw, Russia, '97.....638,209
St. John's, Newfoundland, '99.....29,007	Wellington, New Zealand, '01.....43,638
St. Petersburg, Russia, '97.....1,267,023	West Ham, England, '01.....267,308
Samarkand, Russian Turkestan, '97...54,900	Winnipeg, Canada, '01.....42,336
San Luis Potosi, Mexico, '95.....69,676	Wuchang, China, '98.....300,000
San Salvador, Salvador, '01.....59,540	Yarmouth, Canada, '01.....6,430
Santiago, Chile, '00.....291,725	Yokoha, Niger Terr., '97.....50,000
Santos, Brazil, '97.....15,000	Yokohama, Japan, '98.....193,762
São Paulo, Brazil, '92.....100,000	Zanzibar (British), '97.....30,000
Seoul, Korea, '01.....193,082	Zurich, Switzerland, '01.....152,942

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet		Feet
Abyssinian Plateau.....	5-7,000	Logan, Coast Ranges, Canada (<i>highest known in Canada</i>).....	19,500
Aconcagua, Andes, Argentina (<i>highest in South America</i>).....	22,860	McKinley, Alaska (<i>highest known in North America</i>).....	20,464
Ararat, Turkey in Asia.....	17,325	Mauna Kea, Hawaiian Islands.....	18,805
Mt. Blanc, Alps, France (<i>highest in Alps</i>).....	15,781	Mauna Loa, Hawaiian Islands.....	18,675
Bolivian Plateau.....	10-13,000	Mexican Plateau.....	5-6,000
Brazilian Plateau.....	2-2,500	Mitchell, Appalachian Mts., N.C., (<i>highest in East'n U.S.</i>).....	6,711
Chimborazo, Andes, Ecuador.....	20,498	Orizaba, Mexico (<i>highest in Mexico</i>).....	18,314
Cotopaxi, Andes, Ecuador.....	19,613	Pikes Peak, Rocky Mts., Colorado,	14,108
Elbruz, Caucasus, Russia.....	18,200	Popocatepetl, Mexico.....	17,798
Etna, Sicily.....	10,835	Rainier, Cascade Mts., Washington,	14,526
Everest, Himalayas, Nepal (<i>highest known in world</i>).....	29,002	St. Elias, Alaska.....	18,100
Frémont Peak, Rocky Mts., Wy... ..	13,790	Shasta, Cascade Mts., California... ..	14,380
Fujiyama, Japan.....	12,865	Tibet Plateau.....	10-15,000
Hecla, Iceland.....	5,110	United States, Western Plateau....	5-6,000
Kenia, Africa.....	19,000	Vesuvius, Italy.....	4,200
Kilimanjaro, Africa (<i>highest known in Africa</i>).....	19,780	Washington, White Mts, N.H. (<i>highest in Northeastern U.S.</i>).....	6,293
Kosciusko, Australia (<i>highest in Australia</i>).....	7,336	Whitney, Sierra Nevada, California (<i>highest in Western U.S.</i>).....	14,898

SOME OF THE LARGEST RIVERS OF THE WORLD

	Length in Miles	Basin Area Sq. Miles	Ocean		Length in Miles	Basin Area Sq. Miles	Ocean
North America				Europe			
Colorado.....	2,000	225,049	Pacific	Seine.....	482	30,300	Atlantic
Columbia.....	1,400	216,537	Pacific	Thames.....	228	6,100	Atlantic
Mackenzie.....	2,000	590,000	Arctic	Volga.....	2,400	563,800	Caspian
Missouri.....	3,000	527,155	Atlantic	Asia			
Missouri-Mississippi.....	4,300	1,257,000	Atlantic	Amur.....	2,800	520,000	Pacific
Nelson.....	1,732	432,000	Atlantic	Brahmaputra... ..	1,800	425,000	Indian
Rio Grande.....	1,800	240,000	Atlantic	Ganges.....	1,500	440,000	Indian
St. Lawrence... ..	2,200	530,000	Atlantic	Hoang-ho.....	2,700	570,000	Pacific
Yukon.....	2,000	440,000	Pacific	Indus.....	1,800	372,700	Indian
South America				Irawadi.....	1,500	158,000	Indian
Amazon.....	3,300	2,500,000	Atlantic	Lena.....	2,800	950,000	Arctic
Orinoco.....	1,350	366,000	Atlantic	Mekong.....	2,800	280,000	Pacific
Plata.....	2,580	1,200,000	Atlantic	Ob.....	3,200	1,000,000	Arctic
São Francisco ..	1,800	200,000	Atlantic	Yangtse-kiang. .	3,200	548,000	Pacific
Europe				Yenisei.....	3,000	1,500,000	Arctic
Danube.....	1,770	300,000	Atlantic	Africa			
Dnieper.....	1,200	242,000	Atlantic	Kongo.....	2,900	1,200,000	Atlantic
Dwina.....	1,000	140,000	Arctic	Niger.....	2,600	563,300	Atlantic
Elbe.....	725	55,000	Atlantic	Nile.....	3,400	1,273,000	Atlantic
Po.....	400	27,000	Atlantic	Zambesi.....	1,500	600,000	Indian
				Australia			
Rhine.....	800	75,000	Atlantic	Darling.....	1,100	—	Indian
Rhone.....	500	38,000	Atlantic	Murray.....	1,000	270,000	Indian

SOME OF THE LARGE LAKES OF THE WORLD

	Area in Square Miles	Elevation in Feet	Greatest Depth in Feet		Area in Square Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea.....	26,900	160	225	Huron.....	22,322	582	750
Baikal.....	12,500	1,312	4,550	Ladoga.....	7,000	60	730
Balkash.....	7,800	780	70	Michigan.....	21,729	582	870
Caspian.....	169,000	-85 ¹	2,400	Nicaragua.....	3,600	110	83
Chad, variable with season.....	10,000			Nyassa.....	14,000	1,500	600+
and often more	800-900		12	Ontario.....	7,104	247	738
Dead Sea.....	370	-1,310 ¹	1,330	Superior.....	30,829	602	1,008
Erie.....	9,990	573	210	Tanganyika.....	12,650	2,800	2,100
Great Bear Lake..	11,200	200	—	Titicaca.....	3,300	12,875	700
Great Salt Lake... 2,360	4,218	30-50		Victoria Nyanza....	30,000	4,000	590+
Great Slave Lake.. 10,100	—	over 650		Winnipeg.....	9,400	710	70

¹ Below sea level

DISTRIBUTION OF MANKIND

Mongolians.....	540,000,000	Ethiopians.....	173,000,000
China.....	380,000,000	Africa and Madagascar.....	153,000,000
Japan and Korea.....	55,000,000	North and South America.....	20,000,000
Indo-China.....	35,000,000	American Indians.....	22,170,000
Malaysia.....	30,000,000	Mexico.....	8,765,000
Other Mongolians.....	40,000,000	Brazil.....	4,200,000
Caucasians.....	770,000,000	Colombia.....	3,150,000
Europe.....	355,000,000	Peru.....	2,700,000
Asia.....	280,000,000	Bolivia, Guatemala, and Venezuela.....	4,225,000
America.....	115,000,000	United States.....	250,000
Africa.....	15,000,000	Canada.....	100,000
Australasia.....	5,000,000		

RELIGIONS OF MANKIND

Buddhists and Brahmins.....	650,000,000	Mohammedans.....	180,000,000
Christians.....	440,000,000	Pagans and others.....	250,000,000
Jews.....	8,000,000		

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

a, as in *fat*; *ā*, as in *fate*; *ä*, as in *far*; *â*, as in *fall*; *e*, as in *pen*; *ē*, as in *mete*; *è*, as in *her*; *i*, as in *pin*; *ī*, as in *pine*; *o*, as in *not*; *ō*, as in *note*; *ö*, as in *move*; *u*, as in *tub*; *ū*, as in *mute*; *û*, as in *pull*; *g*, as in *get*; *ġ*, as in *gem*; *c*, as in *cat*; *ç*, as in *cent*.

A double dot under *a*, *e*, or *o* (*ä*, *ē*, *ö*) indicates that its sound is shortened to that of *u* in *but*.

Italicized letters are silent. The sign ' tells upon which syllable the accent is placed. The numbers refer to pages in the book excepting where Fig. is before them, when they refer to figures in the book.

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